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Part II

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THE TRANSFER OF WESTERN MANAGERIAL KNOWLEDGE TO CHINA

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THE TRANSFER OF WESTERN MANAGERIAL KNOWLEDGE TO CHINA

Over the past six years, the Chinese interest in developing managerial skills has moved from what might be termed polite interest to something approaching frenzied pursuit. Presumably, the reason for this change has been a recognition that current deficiencies in Chinese management resources represent one of the key constraints on China's ability to achieve the Four Modernizations. It has even been reported by high-level officials in the State Economic Commission that Deng Xiaoping, himself, has singled out management inadequacies as one of the major shortcomings of Chinese economic advance [1]. One result of all of this attention has been a series of economic policies that have made substantial advances in creating an environment in which professional management can evolve and flourish. These policies have provided the manager with increasing amounts of discretion and autonomy and have tied the results of this decision making power to the performance appraisal and reward systems. The new economic policies have also encouraged experimentation with organizational forms which attempt to overcome some of the limitations traditionally associated with Chinese institutions. At the same time, increasing numbers of Chinese managers are being exposed to Western management practices through a number of different transfer processes. This movement of Western management techniques and know-how represents a fundamental part of the transfer of Western technology to the Chinese. While not as visible as machinery and products, the acquistion of managerial capabilities may, in the long run, prove to be considerably more important. Certainly one could argue that this has been the case with Japan. On the other hand, if the Chinese economic environment is not adequately prepared to receive Western management techniques then the result might be long run failures of the hardware transfers as well. It is the purpose of this paper to examine the process by which the Chinese are acquiring foreign management technology and to speculate on what the likely implications of such practice might be.

An underlying premise of the paper is that Chinese management today is weak. We can see this in a variety of indicators: labor productivity is low [1A], the quality of industrial and consumer products is low and their design outmoded, customer service levels are similarly low, as is worker motivation. In addition, economic planning both at the national level and at the level of the enterprise is unsatisfactory and there has been an inconsistent record of technological modernization throughout industry. Finally, the Chinese enterprise is essentially unable to respond to the sorts of "normal" changes in market demand, product design, and technological innovation, that characterize internationally competitive markets in many high-volume, high product variety, industries. The implications of such inadequacies are significant. Without substantial improvement in these capabilities, it is doubtful that the Chinese economy will be able to achieve the Four Modernizations on schedule or succeed as a competitor in anything but the commodity ends of international markets (where their low wage levels give them an advantage that is sufficiently strong to resist erosion resulting from managerial deficiencies.).

While it is unreasonable to blame all of the problems listed above on managerial inadequacies, a further underlying premise of this paper is that without improvement of Chinese managerial skills, neither the economic reform movement nor the acquistion of foreign technology is sufficient to achieve Chinese expectations as to satisfactory levels of economic achievement. Specifically, after 37 years of inconsistent attention to the managerial function, it appears necessary for the Chinese to invest in managerial skill development and the professionalization of the managerial function. The questions specifically to be addressed by this paper are: Can Western approaches to management contribute to overcoming the problems identified above? If so, what is the most effective means of transferring this knowledge to China? And, will the outcomes be socially, as well as economically, desirable? In anticipation of the following discussion, my opinion is that Western approaches to management are both responsive to Chinese needs and transferrable enough to the Chinese managerial situation to make a substantial contribution to Chinese economic growth. In order to accomplish such transfers, however, the Chinese must create a receptive environment which stresses the professionalization of the management function. This they appear to be doing. While the ultimate social desirability of any such transfer remains to be seen. I believe that if Western approaches can be adapted by the Chinese to suit their cultural preferences, the resulting hybrid model of management should be a positive addition to Chinese society.

THE IMPORTANCE OF MANAGEMENT TO ECONOMIC DEVELOPMENT

The contribution of professional management to the achievement of economic well-being has been well recognized in the industrialized countries, at least since the onset of the scientific management revolution launched by Frederick Taylor and his counterparts in the latter part of the last century. The business historian Alfred Chandler has argued quite strongly that the rise of the modern economy in the U.S., Europe, and Japan, required the development of the multiunit business enterprise and the development of the modern multiunit business enterprise, in turn, required the professionalization of management:

> ... the needs of the new large industrial and marketing enterprises brought a professionalization of managment .... Such professionalization encouraged the rapid spread of new administrative techniques, and helped managers to identify themselves as a distinct economic group. [2: p.456]
>
> * * *
>
> The impact of these professional activities was, of course, gradual. .... By the mid-twentieth century, however, professionally oriented, salaried career managers were the men who had taken charge of the large multi-unit enterprises dominating the critical sectors of the American economy. [3; p.468]

The contribution of management to economic development in developing countries, while perhaps less obvious and certainly less well chronicled, has recently been gaining some of the attention that Chandler's observations would suggest it deserves. In 1983, the World Bank devoted a major portion of its World Development Report [4] to the role of management in development. Although the focus was on macroeconomic management, many of the conclusions addressed the need for a strengthening of the management of microeconomic institutions and practices. In particular, the management of state-owned enterprises was singled out for special attention given the relatively disappointing experiences that so many developing countries have had with such organizations. The report concluded that often the management of these activities become over-extended as the needs of the constituencies served by these organizations accelerates beyond their managerial capabilities. It argues strongly that any improvement in the future of such organizations depends on their ability to acquire sophisticated managerial skills and to create an operating environment conducive to the expression of managerial professionalism.

At a more specific level, a number of diverse studies have underscored the contribution of management to economic performance in developing countries through the use of empirical and case analysis. Data comparing productivity in Japanese textile factories in China and Japan, in the nineteen twenties and thirties [5; pp. 155 - 160], for example, found labor in the factories in China to be considerably less productive than their counterparts in Japan. Among the reasons given for this difference, was the lower level of management in the factories in China. Furthermore, in comparing Chinese and Japanese factories operating in China, the relatively unfavorable situation of the Chinese factories was partly attributable, according to the author, "to improper management [rather] than to inferior technology [6: p. 157]."

Indeed, managerial deficiencies have been seen to be a major weakness in many developing countries. A multicountry study of technology transfer in developing countries in the nineteen seventies, for example, concluded as its major finding that: "... firms of developing countries have a limited capability for diagnosing problems and little understanding of how application of new technologies can be useful and valuable to them [7: p. 4];" clearly, management deficiencies. Similarly, in the case of Tanzania, inadequate levels of trained managers stymied policies of "indigenization" and frustrated the development effort [8; pp. 96-97]. Studies of the NICS (Newly Industrializing Countries), on the other hand, suggest that success in developing managerial skills is a prerequisite for moving beyond small scale, entreprenueruial efforts into institutions that will power a nation's development. In the case of Korea, for example, managerial skills in a variety of areas, ranging from the ability to create institutions that support industrial and governmental interrelationships to playing an active role in the international marketing of Korean products, have had a significant role in the fashioning of the Korean success story [9].

More recently, and more to the issue at hand, an empirical study, by the present author, of the influences of market forces on Chinese industrial innovation at the level of the individual enterprise found after studying the responses of sixty-five managers that the education of the enterprise's manager is the most important factor in differentiating between those enterprises that perceive market influences as being important and those that don't [10]. The implications of such a finding are significant in appreciating the importance of the transfer of managerial knowledge to the Chinese:

> ... it is difficult to escape the conclusion that .... educated managers perceive their operating environment differently from managers who aren't educated. If one acknowledges that one of the major benefits associated with higher education is the ability of the educated individual to confront new situations without a need to rely on traditional knowledge or heuristics, then th[is finding] might be interpreted as indicating that the manager's perception of the role of the market might be more important than the actual level of market influences in a market, and that that perception is best explained by the educated manager's ability to accept challenges and identify opportunities that such challenges bring [11; p. 25].

In a somewhat similar vein, the director of the Council of Industry for Management Education in the U.K. has observed, with reference to Britain:

> ... our future success depends, more than with any other body of men and women, upon our senior managers in industry. .... hope for this success must depend to no small extent upon the link between 'management and learning,' upon the tne need of management for learning, and upon the successful fulfillment of that need [12; p.viii].

THE TRANSFER OF MANAGERIAL KNOW-HOW

The conclusion to be drawn from the existing body of knowledge is that the potential contribution of professional management to the process of economic advancement in developing countries can be quite large. Without attention to the development of managers, economic achievement is problematical. It is also evident, however, that the acquisition of sophisticated managerial capabilities is not necessarily something that a developing country can accomplish simply, or on its own. The concept of "modern" management is one that has developed in the advanced industrialized countries of the West and typically is somewhat out of consonance with the traditional approaches to leadership and administration found in the industrial and public sector institutions of the developing world. Consequently, the developing nation wishing to improve its managerial resources and capabilities must engage in a transfer experience that is similar, if not identical, to more hardware oriented technology transfers. In fact, it is this "generic" similarity which exists among varieties of technology transfer that allows us to adopt a conceptual model of hardware transfer to understand the transfer of managerial knowledge, or "software."

One useful way to conceptualize the factors involved in creating a successful transfer of management technology is to adapt a descriptive model employed by Wallender [13] to examine the transfer of management advice and assistance. Wallender suggests three factors as being sufficient to determine the characteristics of a technology transfer. These factors are: the internal characteristics of the firm, the external environment, and the process of consultation. In adapting Wallender's model to the transfer of managerial know-how, the three factors that will be used to describe the process are: the existing capabilities of Chinese management, the external environment in which Chinese managerial capabilities will develop, and the process of transfer of managerial knowledge that is employed. This scheme is illustrated in Figure 1.

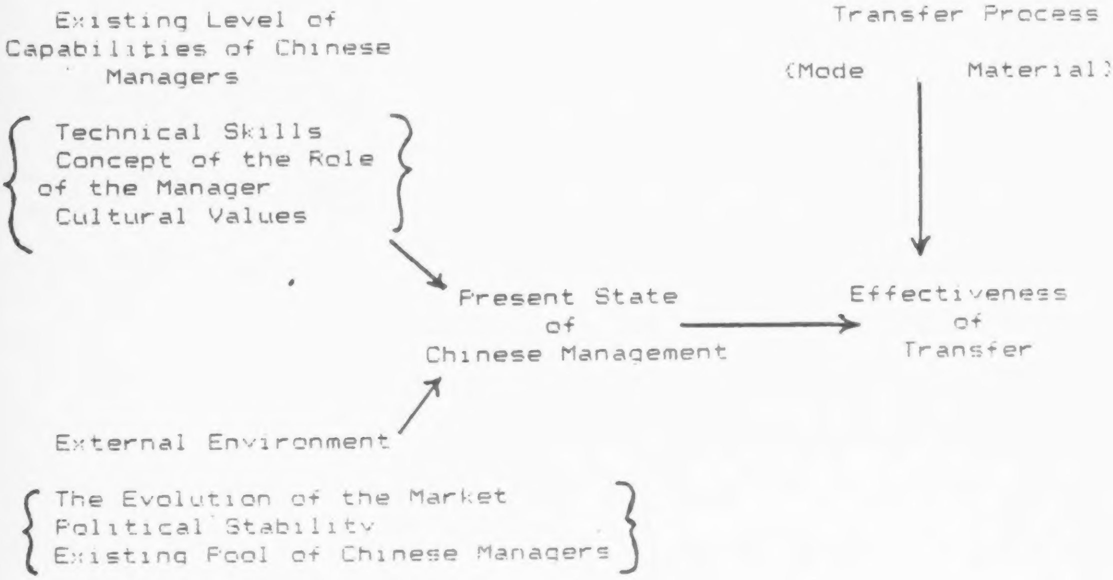
The first of the three factors to be considered in appraising the process of transferring managerial know-how to the Chinese is the existing level of capabilities of Chinese managers. Here, we are primarily talking about two separate but interrelated issues: (1) what is the existing managerial skill inventory among the Chinese managerial corps?, and (2) what is the role of the manager in Chinese society and how does this differ from that of the West? A third consideration, the relationship between Chinese cultural values and Western management will also be briefly discussed.

The description of the external environment in which Chinese managerial capabilities will develop involves three major and interrelated issues: (1) the nature of market evolution in China and the likelilhood for its continuation, (2) the nature of political stability within the Chinese economy and society, and (3) the existing pool of Chinese managerial personnel. Combining existing Chinese managerial skills with considerations of the environment that they will operate in should provide us with conclusions regarding the present state of Chinese management.

The third component of the appraisal deals with the transfer process itself. Here we will consider both modes of transfer and content. The discussion will emphasize "fit" (i.e., is the material being transferred appropriate for the Chinese

FIGURE 1

THE TRANSFER OF WESTERN MANAGERIAL KNOWLEDGE TO THE CHINESE


Existing Level of Capabilities of Chinese Managers
Technical Skills
Concept of the Role of the Manager
Cultural Values
Transfer Process
(Mode Material)
Present State of Chinese Management
Effectiveness of Transfer
External Environment
The Evolution of the Market
Political Stability
Existing Pool of Chinese Managers

situation?), and outcome (i.e., given our impressions of the exisiting state of Chinese management, what is the likely rate and direction of change we can expect on the basis of the modes of transfer being employed?).

THE EXISTING LEVEL OF CAPABILITIES AMONG CHINESE MANAGERS

Technical Skill Inventory

A Concept of Modern Management

With five thousand years of history and more than 400,000 economic units currently operating it would be presumptious to suggest that there isn't already a significant body of managerial expertise available within the People's Republic. Quantity and longevity, however, do not necessarily provide useful indicators of the level of sophistication of that expertise. During the twentieth century, a general body of knowledge regarding the management function has evolved in the advanced industrialized nations of the world which is now almost universally regarded as "modern" management. The conditions under which modern management practices developed are considerably different from those which have been prized during most of the nearly thirty-seven years of communist rule in China. As a result, the level of sophistication in modern management techniques that have been practiced in China vary considerably from function to function. It is the purpose of this management skills inventory to appraise that level of expertise.

Before begining an appraisal of managerial capabilities within the Chinese economy, it is useful to agree on a definition of what is meant by "modern" management techniques. To be useful, any such definition must be able to capture the "essence" of the managerial role and managerial behavior. One approach which captures some of this essence is to contrast what has been called the "rational professional model," which is representative of "modern management" approaches with more "traditional" styles of management [14; pp. 110-111]. In this case, modern managment is characterized by a corporate (as opposed to an entrepreneurial) culture; by a systemic and specialized (vs. a more holistic and or fluid) structure; by delegative and/or participative managment (as opposed paternalistic or authoritarian); by open, explicit, and dissemination-oriented communications (vs. secretive, implicit communications characterized by information hoarding); by staffing based on markets and skills (vs. a proclivity for nepotism); by meritocratic advancement (as opposed to advancement based on personal loyalty); by capital- (vs. labor- and skill-) intensive operations; and by pro-active (vs. reactive) marketing.

Aside from the central behavior of adopting a professional managerial style, the characteristics of which were enumerated in the preceding paragraph, one must also assume that an essential part of "modern" management is the development of specialized managerial skills in each of the major functional areas of business: operations, marketing, accounting, finance, and human resource management. While for many observers it is just these very skills that define modern management, it is the view of this report that they are necessary but not sufficient accouterments of the establishment of a modern managerial practice.

The Present-day Chinese Manager

In a cameo portrait of a Chinese manager, Jay and Linda Matthews have characterized Li Guisheng, a director of a workshop at the Beijing Electric Motor Factory as "... a simple, conscientious worker, the sort who keeps economies afloat all over the world [15; p. 62]." In many respects, this description captures perfectly the nature of the a large proportion of Chinese managers, particularly those whose appointment to management occurred prior to the economic reforms of the past few years. These individuals came up through the ranks, in a world that was characterized by almost absolute attention to the operations side of industry. As Walder has observed:

> Factory executives -- plant directors, vice directors, and the heads of staff departments -- [were] only rarely trained in science and technology, or in business and financial administration. The people who [were] so trained -- in production design, engineering, finance, metallurgy, mechanics, production planning, and other specialties -- [were] concentrated in ordinary staff positions in technical, production, and finance departments, where they have typically worked, without promotion, throughout their careers. The path to executive positions has generally been through line management -- from among shop directors or those Party branch secretaries who have involved themselves closely with production. This outcome is the result not merely of the decade of the Cultural Revolution, but of most of the two decades after 1957. [16; p. 51]

In a world where the producer and customer rarely met, where product design was uniform across the nation, and where price was controlled by the state, manufacturing skills were the essential prerequisite for managerial advancement. Marketing, including distribution, was the responsibility of the state. Capital was allocated by the state and assigned for particular reasons. The idea of alternative investments was something considered only at levels above the enterprise and so financial skills were not needed within the enterprise itself. Personel decisions were often made more on the basis of political considerations than on merit and, given the virtual ownership of the individual by the dan wei [17], there was little in the way of attention being paid to the familiar issues of motivation, evaluation, and reward, that we associate with human resources management in the West. Finally, with the locus of much decision-making and analysis taking part at levels of the economic system above the enterprise, the collection of information and the development of management information practices was never given the opportunity to develop. Furthermore, in the wake of exposes regarding widespread exaggeration in the reporting of economic data to higher level officials during the Great Leap Forward and Cultural Revolution periods, it is unlikely that the operational environment in China during much of the post-1949 period was one conducive to the collection and dissemination of data by which management could be objectively appraised.

The actual level of training and experience of Chinese industrial managers in the late nineteen-seventies is difficult to pin down with any degree of precision. It is clear from a variety of interviews and published sources that most had considerable operational experience and that a fair degree of Soviet-inspired industrial engineering know-how was possessed by, or available to, them. The level of formal training in managment, however, was probably pretty low. In 1966, on the eve of the Cultural Revolution, there were only six departments of Industrial Management in all of China's universities [18; p. 185] and it is estimated that only 6% of all Chinese university graduates between 1948 and 1963 had finance or economics majors [19; p. 182]. Furthermore, the material included in the curricula of such programs was considerably different from that offered in the West.

Formal Education for Chinese Managers, 1940's - 1980: A Digression

In the late nineteen fourties, prior to the Communist takeover, business management departments were in operation at a number of universities around China [20]. The curricula in these programs were essentially industrial engineering oriented. After 1952, these types of departments were replaced by a new form of industrial management department that numbered between 20 and 30, nationwide. A typical undergraduate program in industrial management consisted of coursework in three major topic areas: Marxism-Leninism-Mao Zedong thought (25% of total hours); Cultural and Technical background courses (45% of total hours) - foreign languages, mathematics, mechanical drawing, engineering, machine design, etc.; and Economic Management courses (30% of total hours) - industrial economics, business management, statistics, accounting, work standards, etc.. In addition, first year cadre training to upgrade the work level of managers by teaching Marxism-Leninism-Mao Zedong thought and Economic

Management courses were also offered, as were graduate programs to train faculty and researchers, and correspondance courses to assist managers on the job.

In the 1950's Soviet faculty were invited to China to assist in the teaching of management and the course offerings took on a Soviet perspective. At the same time, engineering schools began to offer engineering economy where students took normal engineering courses during the first two years of their education and courses on industrial economics and business management during their final two years. Richman summed-up Chinese managerial education in this period in the following terms:

> Little attention is given to operational theory, explanation, prediction, or problem solving in the Chinese management course, and there is virtually no study of underlying principles or concepts. Little emphasis is placed on the managerial functions of staffing, control, or direction - apart from ideological factors - and virtually no attention is given to empirical aspects of organizational or human behavior, organization theory, the behavioral sciences, and various other courses covered in American management courses. In fact, behavioral science education of the Western type is completely absent in Chinese economic programs. The Chinese management course may serve to develop mechanical managerial skills of various types and to introduce the student to some of the managerial functions in a largely descriptive way, but it does little to develop a basic theoretical underpinning or a creative and analytical approach management problems. [21; pp. 188-189]

The outbreak of the Cultural Revolution in 1966 led to the total destruction of industrial management training in China. During this period, such courses were not taught in China and the faculty associated with such courses were generally treated badly.

By 1979, however, thirteen departments of industrial economics had reopened. At that point in time, the coursework tended to center around political economy, with Das Kapital as the principal text. At People's University, in 1980, courses on micro and managerial economics were restricted to economics majors and were not open to management students. Furthermore, long range planning was not taught to management students because "such planning is done for the entire national economy." Consequently, long range planning was the preserve of the Department of National Planning. Organizational Behavior courses were not taught at all. Field study and student projects were emphasized, however, and management students were sent to factories to study conditions there as part of their coursework

The Rejuvination of Chinese Management: The 1980's

Today, China is undergoing a transition in which younger, better trained managers are replacing older, more experienced, veterans of industry. These new managers have a higher degree of college education and more technical training. The magnitude of this transition can be seen in a June 1985 survey of managers in 3000 key large and medium sized enterprises, where out of 2900 of these enterprises, 20% of their cadres, numbering 18,000 in all, were 40 of age or younger, 63% were 41 to 50 years old, and the average age was 45. Furthermore, seventy four percent of the leading group members had university or college educations. Among factory directors surveyed, eighty nine percent had universisty and college educations, an increase of 40% over conditions before the readjustment [22].

Yet, despite their more impressive credentials, the newer and older managers continue to share many of the same exposures in terms of their managerial preparation. These similarities lay in the operational/technical backgrounds that both older and newer managers have in common and the lack of formal training in modern managerial methods. This can be seen in Table 1 which traces the career paths of a number of managers who attended the Dalian training program [23] during 1984. While the group reported on in this Table represents a totally opportunistic sample of managers with no suggestion of representativeness to any larger population, in any fashion, there are patterns of commonality in the backround of these individuals which are striking. In particular, the strong technical orientation of their pre-managerial experience is very much evident. Also evident is the ladder of administrative positions that the "new" Chinese manager is apparently on in his or her climb to the top. Finally, the absolute absence of any marketing or financial experience both lends credence to earlier characterizations of Chinese management and dramatizes the differences which exist between Western and Chinese managerial careers.

The Managerial Role

Managerial Practices Versus The Practice of Management

Any discussion of the emergence of management in a developing country environment runs the risk of confusing or overlooking the noun/verb character [i.e., "management" - the verb, and the

TABLE 1

CAREER SUMMARIES OF A SAMPLE OF 1984 DALIAN PARTICIPANTS

DEPUTY MANAGER/ENGINEER, PROVINCIAL ELECTRONICS INDUSTRY COMPANY:
University graduate: radio engineering
Administrative work in local machinery bureau
Head of production technology bureau (electronics and machinery products)
Enterprise manager
Deputy manager, provincial electronics industry company

DEPUTY DIRECTOR/CHIEF ENGINEER, PROVINCIAL ELECTRICAL COMPONENTS FACTORY
1963 University graduate in electronics and physics
One year post graduate work (at another university)
1964-1978 R&D worker at factory
1978-1980 Head of factory technology department
1980-present Deputy director of factory

DEPUTY DIRECTOR, PROVINCIAL FOOD FACTORY
1970 University graduate in biology
1970-1973 R&D worker at factory
1973-1977 Head of workshop at factory
1977-1979 Food research institute
1979-1982 Factory planning department
1982-present Deputy director of factory

ASSISTANT TO FACTORY ENGINEER/ASSISTANT ENGINEER, PROVINCIAL TEXTILE MILL
1968 Middle school graduate
1968-1973 Worker at textile mill
1973-1977 Attended textile university
1977-1979 Returned to factory as technician
1981 Head of workshop
1983 Assistant Director of Factory

DEPUTY DIRECTOR, PROVINCIAL TEXTILE MILL
1958 University graduate, textile department
1958-1980 Began as workshop technician in technical department and rose to engineer
1980 Deputy director of factory

WORKSHOP DIRECTOR, PROVINCIAL TEXTILE MILL
1963 University graduate from textile college, major: cotton textiles
1963-1968 Assigned to textile bureau doing technical work
1979-1983 Progressed from factory worker through: group leader, technician, engineer. Was in technical department in mill that was responsible for process innovation.
1983-present Head of workshop

DIVISION DIRECTOR, MINISTRY BUREAU
Graduated as engineer
8 years with Chinese Academy of Science in research work
3 years as engineer in a factory under one of the ministry's bureaus
2 years responsible for technical department in a provincial company
2 years responsible for technical information department in a provincial bureau
6 years at ministry

DEPUTY DIRECTOR, MUNICIPAL TEXTILE FACTORY
Middle school
Worked in factories and attended sparetime school
4 years army
28 years at original factory beginning as worker
Chief of workshop
Deputy director for administration

DEPUTY DIRECTOR, PROVINCIAL TEXTILE COMPANY
Graduate in textile engineering
Technician in factory
Engineer
Head of workshop
Deputy director for production

HEAD OF RESEARCH INSTITUTE, MUNICIPAL DYE FACTORY
Graduate engineer
Worked in factory
Workshop head
Department head
Deputy director of research institute

DIRECTOR, MUNICIPAL AUTOMOTIVE COMPONENTS FACTORY
Graduate engineer
Worked in forklift factory as technician, head of department, deputy director
Deputy director of automotive components factory
Director of factory

DEPUTY DIRECTOR, MUNICIPAL METER FACTORY
Graduate engineer
Technician in new product development
Department head
Deputy director for new product development

DEPUTY DIRECTOR, PROVINCIAL PHARMACEUTICAL COMPANY
Worked in technical department
3 years as head of workshop
1 year as vice chief engineer
Deputy director

NOTE: Each individual represented in this table comes from a separate factory.

"management" - the noun] of the term "management." In the case of China, in particular, we must talk about the development of both managerial skills and the emerging concept of "the manager" (the practice of management). The history of management in the post-1949 Chinese economy appears to indicate that far more attention has been paid to the former while the practice of management has over this same period of time received far less attention, even agressive attacks [24]. Yet to emulate the success stories that are being written about the contribution of management to economic development in a number of developing countries it becomes imperative to not only acquire managerial skills but to also establish a culture of professional management that serves to both sustain an "attitude" conducive to economic expansion [25] and which supports the local acculturation, harmonization, and utilization of so-called "modern" managerial skills.

Definitions of management practice and the role of the manager almost inevitably fall short of what is desired. The reasons for this are many but most involve the inadequacies of categorization schemes which capture the practice of management and conflicting definitions of what the role of the manager should be. In addition, the clear operational distinctions between functional managers and the general managers can also serve to complicate issues if the discussion fails to separate the practice of management from managerial practices. Accordingly, this paper will focus on the role of the general manager -"executives in generalist or general-management jobs: that is individuals who hold positions with some multifunctional responsibility for a business [26; p. 2]."

Kotter suggests that the role of the general manager can be described in terms of the following challenges and responsibilities:

> * Setting basic goals, policies, and strategies despite great uncertainties.
>
> * Achieving a delicate balance in the allocation of scarce resources among a diverse set of functional and business needs. Not allowing short-run concerns to dominate long-run ones, or marketing issues to stifle production needs, etc.
>
> * Keeping on top of a very large and diverse set of activities. Being able to identify problems that are out of control and to solve them quickly.
>
> * Getting the information, cooperation, and support needed from the bosses to do the job. Being demanding with superiors without being perceived as uncooperative.
>
> * Getting corporate staff, other relevant departments or divisions, and important external groups (e.g., big unions or customers or suppliers) to cooperate despite the lack of any formal authority over them; getting things done through them despite resistance, red tape, and the like.
>
> * Motivating and controlling a large and diverse group of subordinates. Dealing with inadequate performance, interdepartmental conflict, and the like. [27; pp. 12-18]

There is nothing in this set of activities that would appear to make it particularly Western or particularly not Chinese. Of course, some Chinese industries remain under rather tight control from the central planners and in these industries the managers have fewer of the responsibilities listed by Kotter than do managers in industries which have been granted extensive levels of autonomy. On the whole, however, although Chinese enterprise managers may not be anywhere near as responsible for goal determination and strategic formulation as their Western counterparts, this would be the only major difference between what might be expected between the two sets of managers. In fact, an empirical comparison of Chinese and Western European managers that was conducted in China in 1980 (before the reforms really took effect) concluded that at the top management level, there was relatively little difference in terms of influence in a variety of decisions between the Chinese and European managers [There were, however, some significant differences at the middle management level, particularly with regard to hiring of new workers, organizational redesign, and establishment of work hours] [28].

While the responsibilities might appear to be similar, however, the way in which the manager goes about fulfilling those responsibilities, operationalizing those expectations, and being a manager, might differ considerably between the two cultures, and those differences might have significant implications for the transfer of managerial know-how from the West to the East. Henry Mintzberg's study of managerial work [29; pp. 54-99] suggests that the average manager in the U.S. spends his time acting in a variety of roles. Mintzberg has identified ten of these roles and grouped them into three major groups:

Group I: Roles concerned primarily with interpersonal relationships

1. the manager as figurehead: a symbol of formal authority.
2. the manager as leader: providing guidance and motivation and defining the culture of the organization.
3. the manager as liason: addressing horizontal institutional relationships.

Group II: Roles concerned primarily with information

4. the manager as monitor: acquiring and using information to understand what is happening within the organization and its environment.

5. the manager as disseminator: sending external information into the organization and internal information from one subordinate to another.

6. the manager as spokesman: transmitting information out to the organization's environment.

Group III: Roles concerned primarily with decision-making

7. the manager as entrepreneur: initiating and designing much of the controlled change in the organization.

8. the manager as disturbance handler: dealing with involuntary situations and change that are partially beyond his or her control.

9. the manager as resource allocator: overseeing the system by which the organization's resources are allocated.

10. the manager as negotiator: providing leadership in major, non-routine negotiations with other organizations or individuals.

In 1983, Joseph Alutto examined a sample of Chinese managers' perceptions of the importance of the various Mintzberg roles. Alutto found that, in comparison with a sample of managers from ten countries, the fourty two Chinese managers that he tested ranked disturbance handling and resource allocation as less important roles than did their foreign counterparts and information dissemination activities as more important [30]. The importance of information dissemination as a managerial role would support a general cultural stereotype of managerial behavior in Confucian societies [31], while the relatively lower importance of resource allocation role would agree with what we know of the last three decades of Chinese management being extremely limited in the amount of resource allocation discretion that was vested at the enterprise level. Despite such important differences, however, the general conclusion that one draws from Alutto's data is that, aside from these few major perceptual disagreements, the differences between Chinese managers and their foreign counterparts are not striking as far as the Mintzberg roles go. This may, however, be more of an artifact of ranking as a methodology than an indication of similarity in managerial process.

Changes in the concept of the role of the general manager do, however, appear to be unfolding today in China. In the late nineteen seventies a story by Jiang Zilong entitled "Manager Qiao Assumes Office" appeared in the Chinese press [32]. The story was widely read throughout the country and manager Qiao quickly became identified as a prototype of the "new" manager emerging in the Chinese economy with the return of economic rationality. Qiao represented the reaccension of managers whose qualifications were based primarily on operational experience rather than political connections; the reappearance of merit as the determining factor in managerial selection. According to Walder [33; p. 52]:

> These people are by no means incompetent. They know factory operations through long experience; they know how to get needed resources out of the bureaucracy; they know how to meet production quotas year after year. But their orientations and experience are rooted in a system that is being changed by the current reforms. Their line orientation conflicts with the staff orientation needed to operate a profitable enterprise under conditions of 'enterprise autonomy'. Enterprises operate profitably under these conditions when their executives are familiar with product design, with the process of technical improvement and innovation, with financial controls, accounting practices, systems engineering, and quality control systems. The bulk of the managerial corps is finding itself ill-prepared by previous careers that demanded little more than meeting quotas and solving procurement problems.

The result was widespread cautiousness in decision-making and a continued reliance on the sorts of human relations skills that have historically led to the development of mutually beneficial (guanxi) relationships. One is struck, for example, with the degree of tentativeness in decision-making and the attention to calculated human interaction that marks the administrative style of the new manager, Jin Fengchi, in another of Jiang Zilong's stories [34].

In 1983-84, a new "prototype manager," Bu Xinsheng, appeared in the Chinese press and stirred up considerable debate as to the desirability of his managerial approaches. Bu, a real person rather than a literary character, managed a collective apparel factory which was near-bankruptcy into a national success. Bu's qualifications included both the operational experience and sensitivity to human relations that marked Manager Qiao. What set Bu apart, however, and provided him such visibility, was his marketing aggressiveness, his willingness to make decisions (one Chinese manager remarked to me that "the lesson that Bu presents to other Chinese managers is that: 1. he really takes on all responsibility; and 2. he runs the factory as a business manager instead of merely serving as a production clerk."), and his ability to perceive the economy and his factory's role in that economy in systemic terms. Bu has been able to identify supply, distribution, and educational activities, for example, in terms that recognize their linkages with his factory and has worked to strengthen these linkages to his factory's advantage [35]. The generalizability of Bu as a prototype "modern" Chinese manager is questioned by detractors, however, who argue that it is far easier to do what he's done with a small collective factory than would be the case with a larger, state-run factory, particularly if the end product being produced is of considerably more social importance than are shirts.

While Bu may, in fact, be too extreme in his aggressiveness and behavior for most Chinese managers today, there is some recent data that suggests significant changes in the perceptions of Chinese managers of their roles. Interviews conducted recently by Chinese researchers with more than 20 Chinese managers, found that seventy percent considered themselves fundamentally as representatives of their factory, while only five percent considered themselves as primarily representatives of the state. The remaining twenty five percent saw themselves as representing both the state and the factory, albeit with some ambiguity over the desirability of such an arrangement [36]:

> Some factory chiefs said that if the chief "represented the factory," then that factory would have more vitality. For a long time now, whole-people-owned enterprise management could not compare with that of collective enterprises. But in terms of the quality of personnel, the capability of the equipment, and the quality of products, the former were often stronger than the latter. But whole-people-owned enterprises had been tied hand and foot. If whole-people-owned enterprises had the collective enterprises' level of independent management, and responsiblity for profits and losses, the factory chief would work as a representative of that factory, everyone would work under a common policy, start the race from the same starting-line, and be measured with the same yardstick, and in this situation whole-people-owned enterprises would not be inferior to collectives. Only by competing under these conditions could the

standard of the factory chief be seen.

Further evidence of changes in the perceptions of Chinese managers regarding their roles is found in some recent empirical evidence by Alutto and Coleman [37], which, on the basis of comparisons of survey responses in 1984 and 1985 concludes that the recent economic reforms have not only altered the way in which Chinese managers regard their jobs but has also affected their expectations regarding job satisfaction. In the latter case, in fact, expectations appear to have grown faster than changes in job responsibilities, resulting in lower job satisfaction. Interestingly, however, a close examination of the data regarding how Chinese managers perceive their responsiblities reveals striking inconsistencies and contradictions and suggests that considerable ambiguity still remains over what it means to be a general manager in China today.

Chinese Cultural Values and Western Management

Despite evidence that considerable convergence has been taking place across a wide spectrum of nations regarding a variety of managerial responsiblities (the mobilization of productive resources, the organization of production, patterns of work, and patterns of distribution of economic rewards [38]), the particularizing influence of national cultures have contributed to a situation where "the issues of applicability, transferability, and utility of advanced management know-how and practices have remained cloudy, if not controversial [39; p. 16]." As Hofstede has observed [40; p.253]:

> ... different nations have different cultural heritages which are largely invisible. The invisible part consists of values, collectively held by a majority of the population (but possibly differentiated by social class), and transferred from generation to generation through education and early life experience in family and schools and through socialization in organizations and institutions. These values have thus grown into societal norms which, in their turn, determine to a large extent the political and organizational solutions which are feasible within that particular culture. No political or organizational system can survive long without some degree of member consensus, unless it is continually supported by outside force.
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> * * *
>
> Organization and management theorists have rarely taken [such] ... wisdom to heart. In the management literature there are numerous unquestioning extrapolations of organizational solutions beyond the border of the country in which they were developed. This is especially true for the exportation of management theories from the United States to the rest of the world, for which the non-U.S. importers are at least as responsible as the U.S. exporters. "Management" itself is very much an American concept, just as earlier the entire discipline of economics was very much an Anglo-Saxon discipline. However, the empirical basis for American management theories is American organizations; and we should not assume without proof that they apply elsewhere.

The question here, then, is: "What effects will Chinese cultural values have on receptivity and possible adoption of Western managerial know-how? While an accurate or satisfactory answer to such a question is probably not possible within the confines of this paper, if at all, it is useful to review a number of impressions of similarity and dissimilarity between American and Chinese management styles that might provide some indication of the role of Chinese culture in accepting or rejecting Western management approaches.

The present author's own research suggests greater degrees of similarity than dissimilarity among U.S. and Chinese managers. A recent empirical study of innovative culture in Chinese organizations, for example, found the prevailing factors to be stikingly similar to those that would be expected in the west [41]. In fact, the author had earlier expressed suprise that Chinese and American R&D management had much more in common than they did in opposition [42]. Likewise, Barry Richman was also struck by the similarities, noting that, despite some obvious differences, "Management within the Chinese enterprise is in many respects quite similar to management within an American firm, particuarly an American factory. The same managerial and productive functions are performed in the many similar ways [43; p.43]." Stephen Graves, reflecting on his experience teaching operations management in Shanghai noted that:

> ... it is difficult to identify a theme that would differentiate the Shanghai projects from those we conduct in Boston. There are certainly differences in objectives and constraints and in the availability of modern hardware and software technology. Nevertheless, the problems and concerns of an operating enteprise seem essentially the same...[43A]

Even in the highly politicized realm of human resource development, Western observers have been struck by the similarities that exist between the two cultures, leading one pair of scholars to exclaim: "Chinese and American managers may have more in common than is commonly imagined [44; p.13]." The limited amount of empirical data that exists concerning this issue supports these impressions of general similarity. A recent survey of American expatriate and Chinese managers in U.S.-owned companies operating in Taiwan, has found considerable aggreement between the two samples of managers regarding job attitudes, job satisfaction, and expectations [45]. This suggests that intrinsic Confucian values are not necessarily resistant to Western management practices. Alutto and Coleman also cite unpublished empirical evidence regarding linkages between job characteristics and managerial satisfaction that are similar in Confucian (Chinese) and Western cultures [46].

Despite such cross-cultural similarities, there are also obvious indications of differences as well. Characterizations of Chinese reasoning, cognition, perception, design, planning and decision-making [47] as they relate to managerial processes suggest a relatively greater acceptance of hierarchical relationships and universal principles than is found in the West [48]. In addition, there appears to be a strong level of emphasis on the personal investment involved in the social contract between work units and people in the Chinese economic system and an often stronger underlying feeling of social responsibilty regarding the relationships between Chinese work units, workers, and society at large. The impact of such differences to the suitability and acceptance of the Western originated concept and practice of "modern management" is problematical. However, in the case of Taiwan, where similar cultural values pertain, one observer has speculated that such cultural factors:

> ... may perhaps diminish its potential of rapidly converging to the more professional model ...

> Thus, although pervasive and significant amounts of effort have been devoted to the development and dissemination of management know-how to Taiwanese firms, effective real progress has been slow in emerging..... Most of the management improvement know-how covers the basic functional areas of marketing, personnel, production, finance and operations research. Because Taiwan is still a highly production-oriented economy, the acquisition of know-how on operational management and control techniques is the most popular with local firms. As a result, improvements in production management and quality control have been rather substantial, as is evident in the cost and quality of exports from Taiwan. Although seminars in marketing and organizational management are also popular, actual improvement in marketing and management effectiveness has not been quite evident, especially on the more strategic level of marketing-concept orientation and managerial professionalism. Therefore, relatively speaking, the transformation process to [modern management] for Taiwanese firms may encounter more constraints than in either Singapore or Hong Kong. [49; p. 116]

The Existing Levels of Capabilities Among Chinese Managers: Summary

The foregoing material suggests that a useful characterization of the typical Chinese manager at this point in time is a technically-trained, operationally experienced individual, whose career and professional skill development have evolved during a period of limited or no market interaction, strict prohibitions against organizational diversification, and limited economic rationality [as we know it in the West] regarding performance evaluation and reward. One of the significant consequences of such a situation is a widespread lack of many of the specific functional management skills that are commonly associated with the concept of "modern management." Table 2 identifies many of these skill deficiencies, based on the author's personal experience and conversations with Western functional specialists with Chinese experience. In a more general management context, the average manager perceives his or her role as being more of an information conduit from the top of the economic hierarchy to the workers below than as a decision-maker/risk-taker. He or she tends to be cautious in the behavior they exhibit and to rely heavily on the human interrelationships that will facilitate getting things done in a society where such interrelationships are of extreme importance. The average Chinese manager appears to be more willing than his Western counterpart to accept the existence of universal principles and the subordination of all economic units to these principles. This perception appears, however, to be colored by a genuine belief in the social responsiblities of the enterprise and the State. In sum, the average Chinese manager, today, is one who recognizes the need for increased managerial sophistication but who is limited in his ability to access or utilize such information. Part of this limitation is due to the system of which he or she is a part; this will be discussed in the next section. Part of the limitation, however, is due to the dramatic gap between what is suggested by the concept of the "modern" manager and the existing capabilities of China's managerial cadre.

THE EXTERNAL ENVIRONMENT

The Evolution of the Market in China

In a nation that has been repeatedly wracked over the past three and one half decades by dramatic upheavals in political movements, it is no exaggeration to contend that the development of professional management in the nation is dependent upon the

TABLE 2

A NON-COMPREHENSIVE SAMPLE OF FUNCTIONAL MANAGEMENT KNOWLEDGE THAT APPEARS TO BE LACKING IN THE CHINESE MANAGEMENT COMMUNITY

MARKETING
- Market Research
- Advertising
- Product Design
- Industrial Marketing
- Consumer Marketing

MANUFACTURING
- Total Quality Control
- Managing High Volume/High Variety Operations
- Value Analysis
- Inventory Management
- Manufacturing Information Systems
- Distribution Systems

ETHICS AND COMPARATIVE MANAGEMENT

CONTRACT LAW

HUMAN RESOURCES
- Motivation & Incentives
- The Concept of Directorship
- The Role of the Manager
- Executive Compensation
- Organizational Design
- Leadership Styles

FINANCE
- Investment Analysis
- Methods of Financing
- International Finance

ACCOUNTING
- Establishment of Control Systems
- Auditing
- Public Accounting

MANAGEMENT OF SCIENCE AND TECHNOLOGY
- Anticipating Technological Change
- Managing Innovation and Creative Groups

nature of social receptivity to development of an ethos of professional management. Today, the policies of economic reform being pursued by the Chinese government appear to be well suited to support the growth of managerial professionalism and to provide Chinese managers with sufficient lattitude to be able to contribute, through the practice of their professional skills, to the improvement of the economic condition in the nation [50]. There are, in particular, four major areas of environmental change that appear to be indicative of significant improvements in the establishment of an operating environment supportive of managerial effectiveness: decentralization of managerial authority, institution of managerial accountability, provision of incentives to motivate performance, and flexibility in organizational design.

Since their coming into power in 1949, the Chinese Communist government has initiated, and halted, a number of attempts to decentralize managerial decision-making authority throughout the economy. The present reform policy, which grants a significant degree of autonomy to the enterprise manager, probably goes further than any previous attempt. Under the new, and continuously changing regulations, the typical enterprise manager now finds himself in a quasi-competitive market place where, although prices tend to be relatively fixed, the manager now has considerable influence in issues relating to such competitive issues as product mix and production volumes, vendor relations, customers served, product design, distribution, advertising, and service policies. Under the new reforms, the Chinese manager must increasingly interact with a variety of capital sources, including equity holders, can meet directly with foreigners in structuring joint venture operations, and must face the enteprises' workers every five years in order to gain reappointment in an election process [51]. The new responsibilities represent a dramatic departure from the past and are exerting a heavy toll on the Chinese manager. As one put it: "As factory directors, we have now to set our eyes on the figures and make mental calculations on our operations all day long. As a factory director in these two years [1981-1982], my work has been much more intense than in the dozens of years in the past [52; p. 6]."

Along with increased autonomy has come increased accountability. Profit has, for all intents and purposes, replaced all of the other so-called "eight great standards" as a single indicator of economic performance. Furthermore, workshops within enterprises are themselves increasingly being treated as responsibility centers. Worker bonuses, funds for worker welfare, innovation, and a variety of other working captial uses are now largely generated out of retained earnings. This emphasis on profit is having a strong effect on the ability of a variety of constituencies to tie enterprise performance in the market to their own well-being and to tie, in turn, managerial performance to their own quality of life. In such situations, the pressure on management to perform becomes all the greater and Chinese management has increasingly sought new approaches to managerial responsibilities. Such behavior helps to support the receptivity of the managerial corps to Western concepts of modern management.

Closely tied to the issue of accountability as defined above is the issue of incentives. The direct link that has been established between enterprise profits and worker bonuses has contributed to the visibility of corporate performance. Piece rate systems are in widespread application throughout China as managers seek to motivate their workforce. At the same time, managers themselves are overcoming their reticence in accepting substantial bonuses as rewards for their part in achieving high enterprise profits. As one manager who had doubled his salary through bonuses put it this past summer: "I say to the workers that managers use their minds and that this is more important than working with hands." This is not, however, a universal response and, in fact, one of the persistent problems constraining Chinese managers is the durability of resentment over differential rewards for managerial performance [53]. A related problem regards significant ambiguity over the relationship between the manager and the Party. The draft law on state-owned industrial enterprises, promulgated at the ninth meeting of the Sixth National People's Congress Standing Committee, reads: "Entrusted by the state, a factory manager exercises unified leadership and assumes full responsibility for directing production and for managing the enterprise." According to Yuan Baohua, this will result in major changes in the role of the party vis-a-vis operational decisions: "the work of the party organization concerning production and management will change from one of exercising unified leadership into one of providing guarantees and supervision [54]." That this topic continues to receive significant attention in the Chinese press suggests that the operationalization of such directives has not been an easy task at the enterprise level [55].

One of the legacies of the Soviet influence on the Chinese economic system has been the virtual homogeneity in organizational design that has characterized Chinese industrial enterprises. This has served to impede their ability to respond to new situations in their environment. This problem is exacerbated by the strong vertical segmentation of the economic system and the all pervasive influence of the individual's work unit. The consequences of all of this is that, internally, the Chinese enterprise is virtually a captive of its past. It cannot diversify in any strong sense of the term because it is constrained not only by ministerial perogatives but also by an inability to quickly adjust its human resources to address new issues, new markets, or new technologies. Furthermore, it cannot spin-off, expand, or contract to any great degree because it serves a major source of social amentities (such as housing, medical care, child care, subsidized meals and utilities, transportation, access to cultural, entertainment, and sporting events and the like) for its employees and, thus, to cut them off from the enteprise would be akin to cutting them off from primary determinants of their social welfare and standard of living, while any addition to the workforce involves a significant commitment to overhead. In sum, at the level of the individual enterprise, the Chinese economic system is not well endowed with organizational flexibility and it does not appear that this will change to any significant degree in the forseeable future. Over the last six years, however, the Chinese have shown remarkable ingenuity in fashioning a variety of collaborative arrangements among organizations so as to overcome the immutable limitations within them. Examples of such domestic joint ventures can be found in the well-known Jialing motorcycle complex in Chongqing [56], and in the reorganization of the Shanghai television industry [57]. Such interorganizational flexibility is providing some of the organizational adroitness that is necessary if management is to fully take advantage of market opportunities and changes.

The Stability of the Government

In all economic systems it is the unpredictability of government intervention rather than the intervention itself that tends to pose most of the intervention-related problems for managers. China is no exception in this regard and the Chinese have had more than their fair share of unpredictabilty in government behavior over the last thirty seven years. Even today, in the wake of unprecendented prosperity, there is no certaintude that the present policy of economic reform is durable and will outlast its author, Deng Xiaoping. Despite protestations to the contrary from the Chinese side, non-Chinese observers must weigh the potential for government inspired disruption in the Chinese economy and the implications of such activities for the development of Chinese management. Furthermore, this must all be done from the realm of speculation since no one really knows what the future holds in this regard.

It strikes this observer that there are two indications that suggest that the present economic reforms are durable and will outlast Deng. First, the observable level of prosperity which exists today in China must be higher than any previous point in recent Chinese history. In addition, the benefits being enjoyed appear to be distributed throughout the economy so that many people, rather than a few, are finding themselved better off than anytime previously. Second, Deng Xiaoping appears to have worked assiduously in seeding his supporters through many layers of the governmental, party, and economic hierarchies, assuring high probability of succession by future generations of Chinese leaders who espouse policies of economic rationality. The recent selection of Wang Zhaoguo, a student in the initial session of the Dalian Management training center, to the Central Committee of the Communist Party, for example, suggests that merit is becoming an important determinant of accension to even the most important positions in the country. Both of these conditions argue that the current economic policies are not only popular among the masses but are also being carefully underpinned by the positioning of ideological supporters who can carry them forward in the future.

Chinese Managerial Resources

One of the major changes that has been taking place in Chinese society as a direct result of the policies of economic reform has been a significant change in the quality of managers that are directing major enterprises. In a speech on "Prospects For Modernization in China," given at the Chinese University of Hong Kong in 1984, Ma Hong, the president of the Chinese

Academy of Social Sciences, said that poor management could partly explain for the bad economic results in China: "According to sample investigation, less than one third of the leading cadres in our country's large and medium-sized enterprises are well versed and know how to run them [58; p. 99]." Today, this situation is being addressed in two ways: 1. the introduction of more youthful and better educated managers and 2. the establishment of national testing of managers.

In an earlier description of the Chinese manager, statistics on the increasing youthfulness and higher educational credentials of the Chinese managerial corps were presented. These numbers suggest that over the past few years major shifts in managerial positions have indeed occurred indicating that the government's desire to increase the sophistication of industrial management has been supported with agressive personnel policies. The establishment of national examinations on management to "certify" holders of, and aspirants to, managerial positions have also appeared to have a significant impact on the way in which managers look at their jobs and the qualifications necessary to advance in a managerial career. Between August 1984 and December 1985, approximately 80,000 managers and directors of large- and medium-sized enteprises had taken this national examination, though the compliance rate is not 100% [59]. While the performance of Chinese managers on the national examinations has apparently been below the level considered satisfactory by the government [60; p.40], the imposition of such examinations is both providing motivation for managers to pursue further training in management and contributing towards the establishment of the concept of managerial professionalism.

At present, the level of formal educational efforts in management are quite small for a nation of China's size. At the begining of this year there were only 22,000 students taking degrees in business and finance in Chinese universities [61]. However, during 1985 it was reported that over 12,000 managers were being trained in 76 institutes established for cadre training. During the prior two years of their existance, these institutes have trained over 10,000 business executives and factory directors. China began to increase the number of such institutes in may 1983, before that there were only five, with some 100 teachers. Enrollment was under 2,000. According to the State Economic Commission all managers and directors and party secretaries of big and medium-sized enterprises will be selected from among the graduates of such institutes and other training centers and institutes of higher learning during the Seventh 5-year plan [62].

Another indication of increasing professionalization of Chinese management, is the creation of the Chinese Enterprise Management Association (CEMA). An arm of the State Economic Commission founded in 1979, CEMA is active in sponsoring workshops and lecture series on managment (such as the Xerox-Unison-CEMA lecture series that has been held in a number of cities in China in 1984-1986), and publishes the journal Enteprise Managment, which contains reprints from the Harvard Business Review [62A]. At present, CEMA has chapters in 29 provinces, municipalities, and autonomous regions, 80 industrial cities, and 12 ministries and commissions. In February 1986, CEMA was reported to have 2,300 group members, 4,300 individual members, and 3,000 associated enteprise subscribers [62B].

One remaining concern regarding the state of Chinese managerial resources has to do with the limited professional mobility that continues to exist in China today. Despite the government's obvious impatience with the slow pace of change taking place in freeing individuals from the tyranny of indenture to their work units, and despite indications of some progress being recently made in this regard recently, Chinese professionals still remain, to a large extent, captives of the work units to which they are assigned. We in the West have come to take professional mobility for granted and often fail to recognize just how important such a right is in creating opportunities for professional advancement, providing outlets for professional creativity, and allowing for the benefits of cross-fertilization between organizational cultures. One wonders, for example, what would have become of an Iaccoca if he had had to remain at the Ford Motor Company? At present, China receives none of these benefits as her managers are bound to the work units to which they have been assigned. The likelihood of continued governmental pressure in the future to provide greater degrees of professional mobility, however, is quite high. One can only speculate in this regard, but it appears that the freeing-up of professional mobility among scientific and technical people will become more possible in China in the future and that greater mobility for managers may follow behind.

The External Environment: Summary

It would appear that the changes taking place within the external environment in which management functions in China are almost entirely positive in terms of supporting the evolution of professional management within the economy. Changes in the economy which are encouraging more market influence are working to provide the Chinese manager with both more autonomy and more decisions which he or she has discretion over. In addition, the present regime has worked carefully to establish conditions that will lead to the continued support of the liberalizing economic policies in the period after Deng Xiaoping. Finally, Chinese managers are being led into greater sophistication through the replacment of experienced veteran managers by better trained, younger managers and by the imposition of examinations that measure the manager's level of knowledge. The formation of the Chinese Enteprise Management Association suggests that the institutional structure to support managerial professionalism is also being developed.

THE PRESENT STATE OF CHINESE MANAGEMENT

According to Figure 1, the present state of Chinese management is the product of the existing level of capabilities among Chinese managers and the external environment in which they work. In both instances, the prognosis for improved managerial professionalism in the future is positive, with the external environment having changed more significantly than the characteristics of the individuals holding managerial positions. This should not be suprising since the environmental elements which have changed the most are those most susceptable to governmental policy interventions. Managerial characteristics, on the other hand, take considerably longer to change. There is nothing in our assessment of Chinese managerial characteristics that would suggest a rejection of the Western concepts of "modern" management, however, it would appear that Chinese attitudes and traditional concepts of the role of the manager will work towards a reduction in the utility of many modern management concepts and, consequently, a slowing down of the spread of such ideas. Counteracting this impedance, on the other hand, has been rather startling changes in the rules governing the responsiblities of the manager in China and these have acted to create a strong need among the managerial corps to become more sophisticated about modern managerial techniques.

THE PROCESS OF TRANSFER

Critical to any technology transfer experience is the process of transfer. Here, we are considering both the mode of transfer that is utilized and material transfered. Although several modes of transfer will be discussed, the major focus of this discussion will be on the establishment of mangement training centers in China.

Modes of Transfer

There are a variety of ways in which a "soft" technology such as management might be transferred between two parties. Among the possible modes of transfer are: books, direct personal interaction through consultants or joint ventures, and collaborative training programs. Each of these will be examined as to applicability to the Chinese situation.

Access to Western managerial theories through the acquisition of textbooks is among the simplest means of transferring managerial know-how, although it is probably also among the most unsatisfactory methods as well. While textbooks represent an "efficient" packaging of ideas in an easily obtainable format, the lack of interaction that accompanies pure textbook learning and the need to place the textbook discussion into the appropriate cultural context, makes pure textbook learning a dangerous proposition. In the Chinese case, these problems are exacerbated by the often low level of translation that are available for many of the textbooks, leading occasionally to major misinterpretations of the lessons being offered.

It is difficult to appraise the usage of Western management textbooks in China today as a primary learning tool. Certainly, such books are available, and one hears repeatedly of particularly well-known books being reproduced and translated redundantly at a variety of Chinese institutions. Since the translation of such books represents a means for faculty members to augment their regular salary, the transfer of Western managerial knowledge through textbook translation will likely continue to be enthusiastically supported for a long time. At the same time, one cannot help but be struck at the influence that Western management books appear to be having on the Chinese press. In particular, the number and variety of business managment books reported in China Daily's Business Weekly are an indication of the popularity of Western-type business literature. A case in point would appear to be the In Search of Excellence [63] "spirit" found in a new book entitled The Experience of Rural Businessmen:

> The book traces the characteristics of a new generation of Chinese farmers. Among the profiles are Cao Yinxiang, a chicken farmer, Jiang Yuanchen, the "Garment King." Chen Xiugong, who turned a lackluster village into a centre of fibreglass production, and Huo Zhouyi who parlayed his carpetmaking into world markets. [64]

Consultants overcome some of the most critical limitations of textbooks by allowing the possibilty of interaction between the supplier of the technology and the recipient. It would appear, however, that except for a few limited exceptions, most of the foreign consultant activity taking place in China today is directed in assisting Western firms hoping to enter the Chinese market. One of the more dramatic cases of tranferring managerial know-how to the Chinese through a consultant was the case of Werner Gerich, a retired West German engineer, who was director of the State-owned Wuhan Diesel Engine Factory for more than a year [65]. Although Gerich became a celebrity in China for the success he had in improving the situation of the Wuhan factory, he apparently left out of frustration with the difficulties of working in the Chinese system. Gerich's parting comments suggest some of the shortcomings of contemporary Chinese managerial practice:

1. Give more authority to factories' quality control departments.
2. Make full use of all available equipment.

3. Give factories a bright new look.
4. Remember: Time means money.
5. Reward workers for good suggestions.
6. Set up training centres for young workers.
7. Consider local weather conditions before introducing foreign equipment.
8. Keep workers' difficulties in mind. [66]

Domestically-originated consulting through the services of "old capitalists" is also appearing as a means for the introduction of Western management practices into the Chinese economy. The China Democratic National Construction Association and the All-China Federation of Industry and Commerce, both comprised of old capitalists, are offering economic consultancy services and training talented industrial and commercial workers in order to invigorate enterprises. At the end of 1984, the association and federation had helped the government run about 700 collective enterprises, and sent 1,000 members to offer economic consultancy services in 600 programs in minority areas of 18 provinces and autonomous regions. In 1984 they had set up 23 schools and 585 training classes with 110,000 trainees. Furthermore, according to the Chinese press, their proposals for reforming the administrative systems in the tea and traditional Chinese medicine industries have been well received by the State Council. The choice of these two industries, however, suggests something less than complete acceptance for this particular consulting effort, if not for managerial consulting in general [67].

Given the increasing presence of foreign partners in joint ventures in China, it would be difficult to avoid commenting on the role of private Western firms in transferring managerial knowledge to the Chinese. Clearly, these firms are involved in the transfer of management know-how as part of their everyday activities, as well as being contractually bound to provide some training. In the case of the Parker Hannifin joint venture, for example, the American side was obligated to take the general manager, among others, to the U.S. for training [68; p.29]. In the case of 3M's one hundred percent owned Chinese subsidiary, the American side also commited to the training of Chinese managers and cited know-how pertaining to "basic information on organizing and inventory system, minimizing waste, controlling pollution and improving productivity [69;p. 26]," as being part of the benefits accruing to the Chinese by virtue of 3M's presence in the country. The twenty top Chinese managers at Foxboro's joint venture in Shanghai were brought to the United States for a basic training program on managerial procedures that began with a two week session devoted to the basics of intraorganizational communications, followed by instruction in sales and financial management [69A]. There is plenty of evidence, in fact, that the Chinese see such joint ventures as "windows on management," and hope to secure managerial knowledge in areas such as:

* the concept of serving the user
* the notion of economic results
* highly efficient and responsibility-oriented management systems
* strict, serious and meticulous workstyles
* better distribution methods
* market forecasting
* order control systems
* centralized procurement and inventory control
* one-stop service [70].

In general, however, such transfer of managerial knowledge has tended to be limited in scope and audience size and often is determined more by the particular mix of participant personalities than anything else. In discussing mangerial training programs for Chinese managers with their American counterparts, one is struck by how little the American corporations know about where their trainees are coming from, how they are selected, and where they will go following their return to China. Furthermore, there are instances of Western joint venture partners being frustrated by the Chinese "system" in their efforts to acquire and train Chinese managers. According to one experienced Western manager, who is trying to develop a cadre of Chinese managers for a joint venture: "We can identify the best and the brightest people coming out of the universities but, despite the promises of the Mayor and other officials, the military and the universities themselves get them first." As a result of all of this, although corporate transfers will undoubtedly continue to grow in importance, one suspects that they will remain difficult to depend on as a reliable vehicle for managerial training and they will vary with the parties involved. Furthermore, with the possiblity of individual mobility increasing in the future and some semblance of a managerial labor market developing, it is quite probable that Chinese managers trained under such auspices will circulate in the international joint-venture community rather than diffuse their skills into the domestic Chinese market, as has been the case in so many other developing countries [71].

Perhaps the most promising of all modes of transferring Western managerial knowledge to the Chinese are the collaborative training centers. The oldest of these is the National Center for Industrial Science and Technology Management Development at Dalian, which is sponsored by the U.S. Department of Commerce and the Chinese State Economic Commission, the State Science and Technology Commission, and the Ministry of Education [72]. This center, which was established in 1980, employs American and Chinese business school faculty to train Chinese managers and government officials in Western management approaches. The Dalian "base" program is currently complemented by an executive program and an M.B.A. program administered by S.U.N.Y. Buffalo. Similar centers exist in Tianjin (Japan), Chengdu (Canada), Shanghai (West Germany), and the European Economic Community (Beijing).

In all cases, the purpose of these collaborative training centers are to expose Chinese managers to foreign concepts of modern management. From a technology transfer perspective several items are relevant to understanding the likely effectiveness of such centers. First and foremost, is the intimacy of teacher-student relations at such centers and the opportunities for direct interaction that exist. At Dalian, for example, American faculty have in past remained in residence for up to five and one-half months. This was a sufficiently long period to allow the development of close ties between students and faculty. Such ties improve the prospects for successful transfer and appear to be relatively durable following the completiton of training. Secondly, in almost all cases the participants ("students") at such centers are experienced managers who are capable of judging the attractiveness and feasibility of material being offered them and can begin the long process of assimilating such lessons into the Chinese cultural context. In the case of Dalian, the Chinese side explicitly requested only the inclusion of American faculty who were functional and not China specialists. The reason for this, according to them, was their desire to see how we manage in the U.S. and not to be told how they should manage in China. The latter, they argued, would be worked out on their own by the participants in the Chinese economic system. A further advantage of the collaborative training programs has been the conscious effort on the part of the foreign faculties to train Chinese successors who will ultimately take on the training process and make it a Chinese effort. In the case of Dalian, American faculty participation has decreased from 100% of an 18 week effort [in 1980] to the present staffing of one three week session, while the Chinese staff teaches two five week sessions. In addition, American business representatives provide lectures during a final three week session.

Given the relatively short life of most of the collaborative training centers, it is difficult, if not impossible, to judge their effectiveness at this point in time. Nonetheless, in the case of Dalian there does appear to be sufficient anecdotal evidence to suggest some level of success. This can be seen in several ways. One of the most visible indicators of performance has been the relatively large number of Dalian alumni who have been promoted into positions of high responsibility. Altnough this might very well be the result of outstanding people being chosen to attend Dalian and, as a result, being preordained as "success stories," the Dalian connection is apparently enhancing their career prospects.

A second measure of performance involves the number of alumni who report trying to implement managerial techniques learned at Dalian. Again, while such data is anecdotal, the quantity of reports suggests that the participants in the program are picking up useful material. In the case of Wang Zhaoguo, a participant in the 1980 Dalian program, who was recently been named director-general of the Central Office of the Chinese Communist Party and a member of the Central Committee, his rise is ascribed to the reforms he initiated as a manager in the Second Automotive Factory in Hubei. "He instituted product design innovations, sent out a sales force, and organized a comprehensive maintenance system for the plant. In a short time, plant revenue doubled [73]." In the case of Zhang Changsong, also a participant in the initial 1980 session and now president of the Board of Directors of the Sino-American International Engineering Company, computer know-how and financial management skills were most important [74]. Yang Jiayuan, deputy director of the management office of the Ministry of Railways and another Dalian graduate, reorganized the Ministry's factory's marketing strategies. "As a result, they landed a big contract to supply concrete posts to Shanghai's Baoshan Steel Works, and were soon earning enough to wipe out the deficits and fulfill their obligations to the state." Another Dalian graduate, who is deputy director of the Shanghai Electrical Appliance Corporation credited the Dalian program with providing him with insights into depreciation, predictions of service life cycles, and management accounting, which are useful in deciding the types of foreign technology to acquire [75]. Similar stories have been found by the Sichuan Province Economic Planning Commissions review of the Canadian program at Chengdu [76]. In the case of a paper mill manager, it was the ability to apply Management By Objectives, break-even analysis, value analysis, market forecasting, and an understanding of domestic joint-ventures, that have been particularly valuable. The manager of a water pump factory reported on employing marketing surveys and utilizing an economic order quantity order system to free up working capital.

Lessons learned at Dalian and, presumably, the other international collaborative centers tend to be diffused by the participants returning to their work units who are frequently expected to share the materials learned with their counterparts who did not attend. In such a fashion, the material from these centers is multiplied and amplifed throughout the country. This helps to address one of the major short-comings of such centers: the relatively small number of managers who can attend. A 1982 survey of 1980 and 1981 graduates of the Dalian program indicated that 135 out of the 172 respondents (79%) gave talks about their experiences and learning at the National Center following their return to their work unit. The amount of time spent in these sessions ranged from 1 hour to 150 hours and the audience size ranged from 10 to 1500 people [77]. The lessons taught at the Dalian program are also experiencing a multiplier effect at Nanjing University where the chairman of the economics department is a 1981 Dalian program graduate who states that his participation in that program was directly responsible for the nature of coursework on operations management, management information systems, science policy, and organizational behavior, being offered at his school. The author's own interviewing of Dalian alumni indicates that the ties among many of them remain strong after completion of the program and that study groups and support networks have been established which lead to the continued reinforcement of managerial development and personal growth and could, perhaps, be the foundation for a new set of quanxi relationships.

Material Transferred

It is common in American business schools to categorize the knowledge being created and transferred by its appropriate functional area. Consequently, one can talk about management studies as consisting of: operations (production), finance, accounting, marketing, and organizational behavior. Most of the collaborative training centers offer coursework in all of these areas, the major exception being the Japanese center at Tianjin which appears to emphasize production skills (see Table 3 for a summary of the programs offered by the various international collaborative training centers). If any functional area appears to be slighted it is the human resources management function. The reason for this is most likely the recognition that while production techniques can be implemented almost immediately, personnel issues may very well require a complete overhaul of organizational structure and value system [78].

TABLE 3

A COMPARISON OF INTERNATIONAL COLLABORATIVE MANAGEMENT TRAINING CENTERS IN THE PEOPLE'S REPUBLIC OF CHINA

CENTER	INITIATION DATE	FOREIGN SPONSOR	FACULTY	DURATION	PROGRAM FOCUS
DALIAN Liaoning	8/80	U.S. Dept of Commerce	U.S. Business Schools	6 months	Base Program Special Programs Senior Executives M.B.A.
CHENGDU Sichuan	10/84	Canadian International Development Agency	Canadian Business Schools	6 months	Diploma program Short courses
TIANJIN	1984	Japanese International Cooperation Agency (Japanese Productivity Center is the contractor)	Primarily Industrial	3 years (for trainers)	Development of training programs Ultimately: consulting expert training short courses Japanese language
BEIJING	3/85	EEC (coordinated by Manchester Business School)	European Business Schools	2 years + 1/2 yr. English	M.B.A.
SHANGHAI	1986	West Germany		4 month	

TABLE 3 Continued

CENTER	PEDAGOGICAL APPROACHES	CONTENT FOCUS	STUDENT BODY	STUDENT SIZE
DALIAN	Lectures Cases Applications paper	Broad-based First yr. MBA	Top and Mid-level managers from large and mid-size enterprises across nation	180
CHENGDU	Lectures Field Studies	Broad-based	Junior managers from small and medium enteprises in Sichuan	300
TIANJIN	Intensive Specialty Training	Production, QC, Finance, Marketing, MIS, Economics	Top and mid-level managers from large and medium enterprises 1/3 nationally, 2/3 Tianjin	25 at present 300 eventually
BEIJING	Group Project 50% of work	Includes 4-6 month internships in EEC firms. Two sessions are to be run between 1984 & 1989, then program will be turned over to private supervision.		
SHANGAHI		Broad range of narrow courses	Top & Mid-level managers from Shanghai	

It is possible on the basis of interviews with American and foreign faculty, in fact, to suggest the following continuum to represent the degree of "take" that the materials offered at such centers have had to date:

Easily Assimilated   Difficult to Assimilate
<-->
Production   Marketing   Finance   Accounting   Organizational Behavior

The 1982 survey of the alumni of the 1980 and 1981 programs at Dalian, that was cited earlier, provides some empirical support for this assessment (Table 4). It indicated that courses in production management, marketing, and financial management were perceived as being particularly useful to these alumni. Whereas Organizational Behavior and Systems Information were perceived as being less useful (Systems Information was, however, seen as likely to be useful in the future).

Despite such assessments, organizational behavior lessons are apparently being employed in Chinese activities. According to Alutto: "Organizational behavior hasn't taken in the sense that you can find large scale examples of particular issues. There are, however, plenty of examples of bits and pieces being used. Issues are being identified as amenable to organizational behavior approaches [79]." One of the reasons for this is that Organizational Behavior issues were formerly the province of the Party and there apparently remains considerable reluctance on the part of enterprise managers to tackle the Party's perogatives so directly.

TABLE 4

EVALUATION OF THE COURSES TAUGHT AT THE NATIONAL CENTER FOR INDUSTRIAL SCIENCE AND TECHNOLOGY MANAGEMENT DEVELOPMENT at DALIAN

by Alumni of the 1980 and 1981 Sessions

COURSE	VERY USEFUL	SOMEWHAT USEFUL	NO USE	USEFUL IN THE FUTURE, NOT NOW
Managerial Economics	37	106	5	25
Production Management	94	76	0	3
Organizational Behavior	43	94	10	18
Managerial Accounting	51	94	9	16
Science & Technology Management	48	93	11	18
Marketing	87	69	3	12
Financial Management	83	76	0	11
Applied Statistics	62	57	1	19
Systems Information	23	58	2	90

SOURCE: The National Center for Industrial Science and Technology Management Development at Dalian, "Statistical Results From Survey of 1980 & 1981 National Center Grads," September 4, 1982.

CONCLUSIONS

The conclusions of this paper begin with the observation that the external environment in which Chinese managers work is probably more receptive to the introduction of Western management techniques than are the managers themselves. This is largely due to the government's policies of economic reform which are creating a situation which is quite hospitable towards the practice of modern managment know-how. At the same time, it appears that much of what is considered the managerial role in the West is similar to management in the P.R.C. and as a result, there is good reason to anticipate relatively good transferability of modern management techniques to the Chinese. Given the observation that the most significant impediment to successful transfer of managerial knowledge is the Chinese manager, himself, it would appear that reliance on a personal yet structured, intimate transfer approach, such as collaborative training centers appears to be the best choice among several different transfer modes. This is because human agents possess the flexibility and interactive properties that are of most value in transferring information in ambiguous situations where there is considerable pressure to achieve a satisfactory solution quickly [80]. The training center approach also appears to be a supportive and yet abstract enough situation to allow the Chinese manager to consider new management practices without intimidation. Despite this conclusion, however, the effectiveness of such transfers are currently difficult to measure. One must defend these activites by arguing for the conceptual appropriateness rather than being able to empirically defend the effort being expended.

One way of considering the likely performance of transfers of Western managerial knowledge to the Chinese is to define what what we, the suppliers of such knowledge, are looking for in a Chinese partner and to assess how likely the present transfer approaches are to yield such a result. Recent research on a large number of joint ventures in the PRC, by Roy Grow, suggests that successful joint ventures are characterized by the following attributes:

1. Impetus to change: a crisis, a returned expert, etc.
2. Enterprises that have good group relationships within the enterprise itself.
3. Very strong managers: possessing education, negotiating skills, and who can act as a catalyst.
4. Very strong relationships between the manager and the chief engineer: organizational and technical synergy.
5. A high degree of autonomy: the ability to maneuver; bargaining room.
6. Managers who could play with multiple points of access in the Chinese economic system and who recognize that multiple points of access also mean the potential for multiple points of control [81].

It seems to this observer that Western management approaches can make a strong contribution to attributes number: 3 - through the development of a philosophy of modern management, as well as with specific functional skill development, that strengthens managerial capability and provides the new perspectives that allow the manager to reduce his reliance on traditional modes of response to new situations; 5 & 6 - through the development of specific functional skills which allow the full expression of managerial autonomy; 2 & 3 - through the sorts of organizational behavior insights that allow for appropriate forms of group design and equitable evaluation and reward schemes. At any event, it seems clear that the combination of recent government policy regarding economic reforms and the technical experience of the new generation of Chinese managers, are not, by themselves, sufficient to produce enterprises characterized by the attributes that Grow has identified. What is missing is the formal training needed to provide the Chinese manager with the skills needed to take full advantage of the evolving situation in the Chinese economy. As players in this drama, it seemingly behooves us to provide as much of that missing ingredient as we can, and to do it in as efficient and effective manner as is possible.

Among the transfer mechanisms considered earlier in this paper, while books, consultancy, and joint-ventures promise to provide some of Grow's attributes, only collaborative training centers appear to possess almost all of the material needed to prepare Chinese managers for the role that he must play. In particular, only collaborative training centers provide the means of satisfying attribute 1 - the return of an expert. Given the very low cost of most of the foreign participation in these collaborative centers (the budget of the U.S. involvement at Dalian is approximately $160,000 per year, the Japanese involvement in Tianjin is approximately $597,000 per year, the Canadian involvement in Chengdu is approximately $582,000 per year, the West German involvement in Shanghai is approximately $630,000 per year, and the EEC involvement in Beijing is approximately $600,000 per year [82]), it would appear that such centers offer a reasonably cost-effective means of pursuing this transfer. While, to date, it is hard to point to any particular commercial event as being percipitated as the direct result of participation in a collaborative training center, it presumably is to all of our [i.e., Western nations] advantage to be able to deal with Chinese managers who are cosmopolitan and sophisticated. It does not seem unreasonable to assume that the attitudes and perceptions that are transferred along with the functional skills at such centers will help reinforce the recent movement toward increased market influences in economic planning and support for individual achievement and opportunity. Since our economic systems are built on these philosophies, it would appear desirable to support their spread into the Chinese economy as well.

The major limitation of the collaborative training centers is the small number of Chinese managers that will ever come directly in contact with the teacher of Western management practices. The number of industrial managers enrolled in the Dalian base program in any year is probably between seventy and one hundred and thirty. The EEC program will train perhaps eighty-five managers over the next five years. The Japanese center will offer a series of focused courses for approximately fourty students each, while the German program envision similar focused courses of 25 to 30 students each. The Canadian program has been teaching a general management program of 120 participants [83]. All in all, to even suggest that such numbers represent a "drop in the bucket" is to magnify these numbers beyond the realm of reliability. In the face of China's huge managerial needs, the major drawback to collaborative centers is that they cannot reach enough Chinese managers. Despite this limitation, however, the centers probably play a much greater role than the participation figures would suggest. They serve as a sign of growing managerial professionalism and as such they support the general field of management development. The Dalian and Tianjin centers publish management journals (in the case of the Tianjin center, the publication run is 70,000 - 80,000 copies per issue) which reach a large number of people. The centers provide libraries and consulting services and ultimately they may provide the hubs in the growing community of academic teaching and research on management. Furthermore, by training the Chinese faculty members who will ultimately train the next generation of Chinese industrial leaders, the international collaborative centers are creating a mechanism that will maintain the transfer of their message for a long time to come.

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NATIONAL SECURITY RISKS OF
DUAL-USE TRANSFERS TO CHINA

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THE NATIONAL SECURITY RISKS OF DUAL-USE TRANSFERS TO CHINA

INTRODUCTION

International scientific exchange and foreign technology acquisition have figured prominently in China's relations with the industrialized world since 1978. Access to advanced foreign technology is one of the major benefits China expects to reap from its open door policy. China's leadership has accepted significant social, political and economic risks in the hope of creating a strong, indigenous science and technology base.

The lion's share of China's imports and bilateral scientific exchanges are in industries or scientific fields that could ultimately improve China's military capability. Steadily increasing imports of electronics, computers, and aircraft technology are only a few examples of China's desire for equipment that could be used for military as well as civilian applications. This may simply reflect the fact that China wants the most up-to-date technology and equipment; most modern technology is, in fact, "dual-use," in the broadest sense of the term. There may, however, be national security risks for the US if the transfer of extremely sensitive technology to China accompanies exports of equipment and scholarly exchange.

The regulations for China which have been incorporated into the Commodity Control List (which regulates all US exports of products with military applications) and the Munitions Control List (which governs exports of weapons and military technology) attempt to limit those risks by precluding the export of technology which will make a "direct and significant contribution to Chinese nuclear weapons and delivery systems, electronic and anti-submarine warfare, intelligence gathering, power projection and air superiority."[1] Often the lines are very fine and difficult to draw. On what basis is it decided what constitutes a "significant" or a "direct" contribution?

This report addresses several basic questions about China's military-industrial complex to help provide a framework that policy makers can use in evaluating the likely effects of dual-use transfers on Chinese military capability, and the attendant national security risks to the US.[2] Within OTA's time and budget limitations it was not possible to develop a clear audit trail from the sale of a particular dual-use item to a specific improvement in China's military equipment. Instead, the report summarizes the available primary and secondary sources in an attempt to answer those questions about China's military industries and defense policy that are relevant to the debate about export controls. Readers of this report should understand that the evidence to support judgments about China's military capability and defense industries is extremely thin. Information is scattered, anecdotal, dated, and often internally inconsistent.[3]

The report is organized into seven sections. The first section is a description of China's dual-use imports to date. What dual-use items has China imported and from whom? How have

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[1] Federal Register, Vol. 48, No. 227, 23 November 1983, p. 53067; see also Ronnie L. Goldberg, "US Energy Technology Exports to the PRC: The Impact of US Policies," Background Paper III, Energy Technology Transfer to China: Background Papers, US Office of Technology Assessment, May 1985, for a more detailed explanation of export controls as they apply to China.

[2] For the remainder of this report, the term "dual use" will refer to equipment and know-how that requires a validated license before it can be shipped to China

[3] This report relies on reports of foreigners who have visited Chinese military factories, articles in the Chinese press, and secondary literature on Chinese defense policy.

Chinese dual-use imports changed since 1981? The second section analyzes whether or not it is possible to know who the end users for those imports are. How likely is it that items sold to ostensibly civilian end users in China will find their way into military factories? This is followed by two sections which evaluate China's defense industries and their ability to assimilate foreign technology. If items sold for civilian purpose are likely to end up in weapons factories, it is important to understand something about the technical and managerial level of China's military industrial complex. How do weapons factories differ from civilian factories? How have recent reforms in the Chinese economy affected the defense industry? How good are China's factories at assimilating foreign technology? What kinds of foreign assistance will affect the capability of the defense sector in China? The fifth section looks at China's national security objectives and the role that foreign technology imports are likely play in military modernization. Are the Chinese pursuing an ambitious program of military development to which selected dual-use items can make an important contribution? What role will military modernization play in China's national agenda? What do the Chinese see as their national security objectives? Can these objectives be correlated with military hardware or dual-use technology requirements? Do they entail the development of capabilities that the US would find threatening? The sixth sections addresses the gaps between dual-use imports and modern weapons production, first in general, and then for two specific cases. What else besides imports of dual-use items will be required to achieve Chinese national security objectives? The seventh section provides final judgments and conclusions.

I. DUAL-USE TRANSFERS TO CHINA: THE RECORD TO DATE

Although dual-use technology sales to China have been the subject of countless newspaper and trade journal articles since 1981, it is extremely difficult to find out exactly how much dual-use technology China has actually purchased or exactly which Chinese organizations are using the equipment and know-how that has been transferred. Several sources contain partial information; no one publication regularly verifies or updates China trade data. China trade magazines (such as the China Business Review) for example, report sales of foreign technology to China bimonthly, yet these accounts often do not provide the correct name of the Chinese end user, the dollar value of the transaction, or the exact name of the supplier firm. The descriptions of the equipment sold are often too vague to know whether or not the item could be easily used for military applications. Moreover, the China trade journals carry many rumors of reported sales and letters of intent that never actually result in a Chinese purchase. Even a signed contract is not a guarantee that the Chinese have made a purchase; a supplier firm may be denied an export license, or one or both parties may change their mind about a sale.

The US Department of Commerce maintains statistics on Chinese imports only from the US. The Office of Export Administration at Commerce publishes an annual report with the dollar value of license granted during the year for each of the items on the Commodity Control List. Nor do these numbers represent actual deliveries, as an exporter may be granted a license only to find that the Chinese have already purchased the equipment elsewhere. The Census Bureau records the dollar value of shipments to China, but not necessarily according to product categories that correlate with those on the Commodity Control List. The Commerce and the Census statistics, moreover, provide no information about Chinese end users; this data is company proprietary and is not released by Commerce. Even if it were possible to find out the correct name of the Chinese end user, detailed data about individual Chinese factories and research institutes is fragmented and incomplete, so that it would be

difficult to assess the capabilities of the particular organization unless it was one familiar to US officials.
The absence of adequate information will continue to limit US capability to understand the long-term results of sales of dual-use items to the PRC.

Until more accurate and more complete data emerges, Tables 1 and 2 together provide no more than a partial picture of what the Chinese have bought. Table 1 (see Appendix A) lists the dollar value of US licenses granted in 1981-1985 for China shipments of selected categories of dual-use items defined on the Commodity Control List. Several changes in the system for recording China licenses since 1981 account for some of the blank rows and columns. For example, no figures appear for computer software licenses in the years 1981-1984, however this does not mean that no licenses were granted. Until 1985 licenses for computer software were captured under the "computer and equipment" category; beginning in 1985 software was broken out as a separate category. One additional caution about Table 1 is that there may be a time lag between the date the license was granted and the shipment date (assuming that there is a shipment). Exporters may apply for licenses of equipment that the Chinese will be purchasing over the next several years.

Table 2 (see Appendix A) is a more in-depth look at Chinese imports of computers, electronics, and telecommunications from US as well as foreign sources during the 12-month period between June 1984 and June 1985. These data suffer from all the same shortcomings as the trade journal data from which they were compiled; however, the table does identify non-US suppliers as well as Chinese end users wherever possible, it offers more specific product information, and it provides dollar values for individual transactions rather than aggregates.

Despite the limitations of the data, it is possible to draw several conclusions about Chinese dual-use imports from the US as well as from the West more generally.

First, the US is not China's only supplier of dual-use technology. The Chinese claim that they prefer US technology, and that they look to other sources only when delays in the export control process force them to. Nevertheless, China is acquiring computers, electronics, and telecommunications equipment in large quantities from other countries besides the US. During the period depicted in Table 2, the countries that appeared to dominate dual-use sales are Australia, Canada, France, Japan, Great Britain, the United States and West Germany.

The Chinese often claim, and US corporations tend to agree, that delays in processing license applications result in lost sales for US companies because China can often acquire the same equipment elsewhere more quickly. If this is true, it doesn't make sense for the US to deny China what can easily be bought from foreign competitors. The claim is quite difficult to prove, however. It is impossible to determine with the available data whether or not Chinese organizations actually try to purchase the same equipment from both US and foreign firms, how many such sales result in orders for non-US goods, or what other considerations may influence a decision not to buy from the US. How Chinese organizations choose individual suppliers or supplier nations is poorly understood in the West. The Chinese do appear to be both price-conscious and brand-conscious, and the sophistication of market research teams in Chinese import-export companies is growing steadily. Undoubtedly, the selling strategies of individual firms also play a role in the process.

In the absence of more complete information it is impossible to say whether or not the Chinese are able to acquire from other suppliers the same equipment denied to them by the US. It is equally difficult to prove, therefore, that US firms are losing China sales to foreign companies solely because of licensing delays.

Second, the range of purchasing organizations is quite broad; it includes national-level trading companies, such as CEIEC (China Electronics Import and Export Corporation); non-trading organizations, such as the Chinese Academy of Sciences; universities; research institutes; ministerial trading companies; provincial trading companies; municipal trading companies; and individual factories. Chinese officials state that these purchases are carefully coordinated and integrated into a single, national plan. However, in the early 1980's the number of Chinese companies with the authority to engage in foreign trade grew rapidly, making it increasingly difficult for the central government to control imports. Although Beijing has since tried to curtail the powers of some of the local companies, the excessive foreign exchange expenditures of 1985 testify to the difficulty of rescinding such authority once it has been granted.[4] It is hardly surprising that poor planning and irrational import decisions are widely reported in the Chinese press. A comprehensive, coherent technology import strategy may exist on paper, but does not appear to be implemented in practice.

Third, the emphasis in dual-use technology purchases from the US is on electronics and computers, with integrated circuit (IC) production technology playing a key role. In 1985 alone, China imported over 45,000 computers for a wide range of applications.[5] The PRC has a myriad of organizations responsible for planning and approving computer and electronics purchases, yet there appears to be relatively little sensitivity to the problems of standardization and compatibility, software, service, and support in many of these purchases. This is evidenced by recent reports in the Chinese press that at least 50% of the computers imported to date have not been installed.

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[4] In one year, on Hainan Island, "nearly 900 companies were formed to help import 89,000 motor vehicles, 2.86 million TV sets, 252,000 video tape recorders, and 122,000 motorcycles." Louise do Rosario, "The Cars-and-TVs Nightmare that Dented Reserves," Far Eastern Economic Review, 20 March 1986, pp. 91-93

Fourth, noticeably absent or under-represented in the trade data is know-how relating to advanced materials such as ceramics and metal matrices. China is still dependent on steel for most heavy manufacturing, and has not mastered the processing techniques for other metals which are required for advanced aircraft or weapon systems.

Fifth, if the Chinese are purchasing these items with the intent to use them for military systems, the range of potential military applications is quite broad. Imports do not appear to be directed at any one service, such as the Navy, or at any one military mission, such as fire control or close air support. The dual-use items China has imported can, however, contribute to the technological infrastructure that will ultimately be needed for advanced weapons production.

Finally, the quantity and composition of China's dual-use imports from the US have changed markedly over time. Table 1 suggests that the number of transactions increased quite dramatically in 1984 and 1985. To a certain extent, this is the result of increased availability of foreign exchange to pay for technology imports. In 1980 Chinese foreign exchange reserves were estimated to be $1.6 billion; by September 1985 they had grown to a record high of $16.6 billion.[6] Healthy reserves resulted in growing imports during those years; Chinese imports increased in value from $11.5 billion in 1981 to over $30 billion in 1985.[7] China's imports from the US grew proportionately; in 1980 US exports to China were valued at $1.2 billion, and by 1985 they had increased to over $3.5 billion, a 29% increase over the 1984 figure.[8]

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[5] See Rick Baum, "DOS Ex Machina: The Microelectronics Ghost in China's Modernization Machine," Unpublished manuscript, May 1986; Lyn W. Edinger, "Recent Developments in China's Imports of Computers and Computer Technology: An Overview," Foreign Commercial Service, US Consul General, Hong Kong, May 1985; John Maier, "When the Sun Goes Down, So Do China's Computers," Computerworld, April 7, 1986, pp. 57-59

It is also likely that the 1984-1985 increase was in part the result of liberalized export controls. It is difficult to say whether sales of dual-use technology as defined by the Commodity Control List increased proportionately to overall exports. It is known that US sales to China of equipment in selected dual-use categories grew in 1985 by well over the 29% increase in total exports. For example, sales of computer and office equipment increased 95% to $173.2 million; industrial machinery sales grew by 145% to $125 million and scientific equipment sales increased by 52% to $249.2 million.[9]

Furthermore, the level of sophistication of technology imports from the US has also grown since 1981. This is particularly true in the area of computers and IC manufacturing. Earlier transactions appear to have been designed to provide Chinese personnel with training in software and basic electronic materials. Later transactions have involved setting up actual production lines for computers and purchasing sophisticated instruments used in IC and computer production. Whether this is the result of a conscious national strategy by the Chinese, growing market sophistication of individual Chinese buying organizations, or increasing liberalization of export control policies on the part of supplier countries is difficult to say.

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[6] "China Reserve Drain," Asian Wall Street Journal, November 16, 1985, p. 17

[7] Louise do Rosario, "The Cars-and-TV's Nightmare that Dented Reserves," Far Eastern Economic Review, 20 March 1986, p. 91

[8] "US-China Trade: Prospects for Growth," in Business America, US Dept. of Commerce, June 28, 1982, pp. 4-5

[9] Jeremy Mark and David E. Rosenberg, "China's Currency Curbs Don't Hurt US," Asian Wall Street Journal, January 15, 1986, p. 1; Vigor Fung, "China's Continuing Foreign Exchange Crunch," Asian Wall Street Journal, February 14, 1986, p. 21

In light of these trends, particularly the growing sophistication of China's imports, US policy makers require information about the end users of dual-use imports before it will be possible to assess the long or short term effects of these transfers.

II. DISTINGUISHING BETWEEN CIVILIAN AND MILITARY END USERS

The concern that dual-use policy equipment and know-how sold to China for civilian purposes will end up in research institutes and factories involved in weapons production is the main reason behind restrictions on exports to China. This section of the report analyzes the relationship between the military and civilian sectors of China's economy to determine the extent to which this fear is warranted.

In China industrial production, as well as most industrial research and development, takes place in units reporting to the industrial ministries of the State Council. China now has over 20 such ministries, of which six are known to engage in weapons-related activities. These six ministries are: the Ministry of Aviation Industry, the Ministry of Electronics Industry, the Ministry of Nuclear Industry, the Ministry of Ordnance Industry, the Ministry of Space Industry, and the China State Shipbuilding Corporation (this last is called a corporation but has the status of a ministry). Although each is now titled according to its product line these ministries were for many years referred to as numbered ministries of machine building. What is now the Ministry of Nuclear Industry used to be the Second Ministry of Machine Building, and so forth. (The ministries will be referred to throughout this report as the Ministries of Machine Building, or MMB's, even though their names have changed.) As is evident even from the way these ministries are named, virtually all of them are responsible for civilian as well as defense products. The Ministry of Electronics Industry is responsible for a wide range of industrial product lines, including earth stations, navigation equipment, computers and peripheral devices, radios, televisions, integrated circuit technology, and components and materials for consumer electronics. The Ministry of Nuclear Industry is responsible for China's emerging nuclear power program as well as for the warheads required by intercontinental and medium range ballistic missiles and guidance systems. The Ministry of Aviation and the China State Shipbuilding Corporation are responsible for aircraft and ships for both military and civilian purposes. The Ministry of Space Industry manufactures not only the ballistic missiles which constitute China's main deterrent, but also communications satellites and ground stations, as well as the telemetry, tracking and control equipment associated with them. Even the Ministry of Ordnance Industry, the primary manufacturer of conventional weapons, produces equipment such as high precision and heavy duty metal cutting machines, forging and pressing tools, diesel engines, and chemical engineering materials. (The major military and civilian product lines for each of the six ministries are provided in Table 3).

Several other ministries play a less central role in military construction. The China Automotive Industry Corporation, for example, produces both civilian and military vehicles.

TABLE 3: WEAPONS PRODUCING MINISTRIES IN CHINA

MINISTRY	MILITARY PRODUCTS	CIVILIAN PRODUCTS
Ministry of Nuclear Industry	Nuclear warheads	Nuclear power reactors, radiation measuring meters and instruments, isotopes, survey and mining equipment, optical instruments, air filters, valves, heat exchanges
Ministry of Aviation Industry	Fighters, bombers, military transport planes, helicopters, aircraft engines, air-to-air missiles	Transport aircraft, agricultural planes, optical recorders, lathes, transducers, switches, motorcycles, various consumer items such as washing machines and air conditioners
Ministry of Electronics Industry	Military avionics; early warning radar; electronic countermeasures; mobile command, control and communications equipment; guided missile navigation systems; fire control and range-finding systems; satellite tracking and ground station equipment	Consumer electronics, computers and peripherals, copying machines, integrated circuits, electronic materials, consumer goods such as televisions and lamps

MINISTRY	MILITARY PRODUCTS	CIVILIAN PRODUCTS
Ministry of Ordnance	Tanks, reconnaissance vehicles, armored personnel carriers, anti-tank missiles, artillery, mortars, rocket launchers, rifles, anti-aircraft and anti-ship missiles	High precision forging and metal cutting tools, chemical products for industry, oil extraction pipes, steel and wooden furniture, electrical appliances, and consumer goods such as bicycles
China State Shipbuilding Corporation	Submarines, destroyers, frigates, fast attack craft, patrol boats, minesweepers, landing craft, naval communications equipment	Bulk carriers, container vessels, offshore drilling rigs, marine engines, yachts and pleasure boats
Ministry of Space Industry	Strategic weapons and delivery systems (ICBM's, SLBM's, IRBM's, MRBM's); tactical missiles; anti-ship missiles	Communications equipment, meterological and earth resource satellites, remote sensing instruments, aerial cameras, expendable launch vehicles

Sources: Karen Bern r, "Doing Business with China's Defense Industries," China isiness Review, May-June 1981, pp. 23-25; Sydney Jammes, "Mil ary Industry," in G. Segal, Ed., Chinese Defense Policy, Uni ersity of Illinois Press, 1984, pp. 117-132.

Finally, the General Logistics Department of the PLA supervises the factories that make the consumer and non-military products required by the PLA, such as uniforms and household goods for troops and officers.

The fact that a particular factory reports to one of the MMB's, therefore, does not necessarily mean that it is a weapon producing factory. Some factories within the MMB's manufacture primarily weapons; some manufacture weapons as well as civilian products; many manufacture exclusively civilian products.

Often it is possible to identify a factory's main product line with information provided freely by the Chinese during a factory visit or sales negotiation. Most visitors to the Shenyang aircraft plant, for example, know they are in a weapons factory. It is also readily apparent that the Hangzhou Fan Factory manufactures fans, and nothing but fans. However there are also enterprises which process materials and manufacture machine tools, parts, and sub-assemblies for use in both military and civilian systems. One foreign supplier of electronics equipment was told for several years that his customer manufactured components for color televisions and taxi-cab radios. Technical discussions with factory engineers later revealed that the components were being manufactured to military specifications. Thus it is not always easy to identify a military customer. As in other countries, weapons factories are often operated and managed by civilians, so there is seldom an obvious military presence.[10] The one exception to this rule seems to be factories and institutes within the Ministry of Space Industry, where security is tight and uniformed personnel are in the factories on a regular basis.

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[10] See Harvey Nelson, The Chinese Military System, 2nd Edition, Westview Press, Boulder, Colorado, 1981, pp. 59-61; Harlan Jencks, From Muskets to Missiles, Westview Press, Boulder Colorado, 1982, pp. 202-204; David Shambaugh, "China's Defense Industries," in Paul Godwin, ed., The Chinese Defense Establish-

One goal of China's Seventh Five-Year Plan is to restructure the machine-building industries in a way that will increase the number of factories making both civilian and military products, and further integrate the civilian and military economies. Weapons-only factories whose production levels have declined over the years are now beginning to produce for industrial and consumer customers. This enables them to earn extra cash and to benefit from previously unused factory floor space and equipment. Over time, the least efficient weapons plants may well convert to entirely civilian production. It is also possible that the more efficient factories may switch from manufacturing both weapons and civilian goods to producing only military products. Thus initial assessments of whether individual end users are involved in weapons production require constant reevaluation.

Complicating the identity problem further is the use of different names for the same factory. This author has visited several factories in the Ministry of Electronics Industry (MEI) which use both the Ministry's numbering system and the name of the factory interchangeably. Thus an enterprise may refer to itself alternately as Radio Equipment Factory #15 of the MEI and the Hualong Electronics Plant.

Finally, other seemingly civilian organizations besides the industrial ministries may be directly or indirectly involved in weapons research, testing, and production. The Chinese Academy

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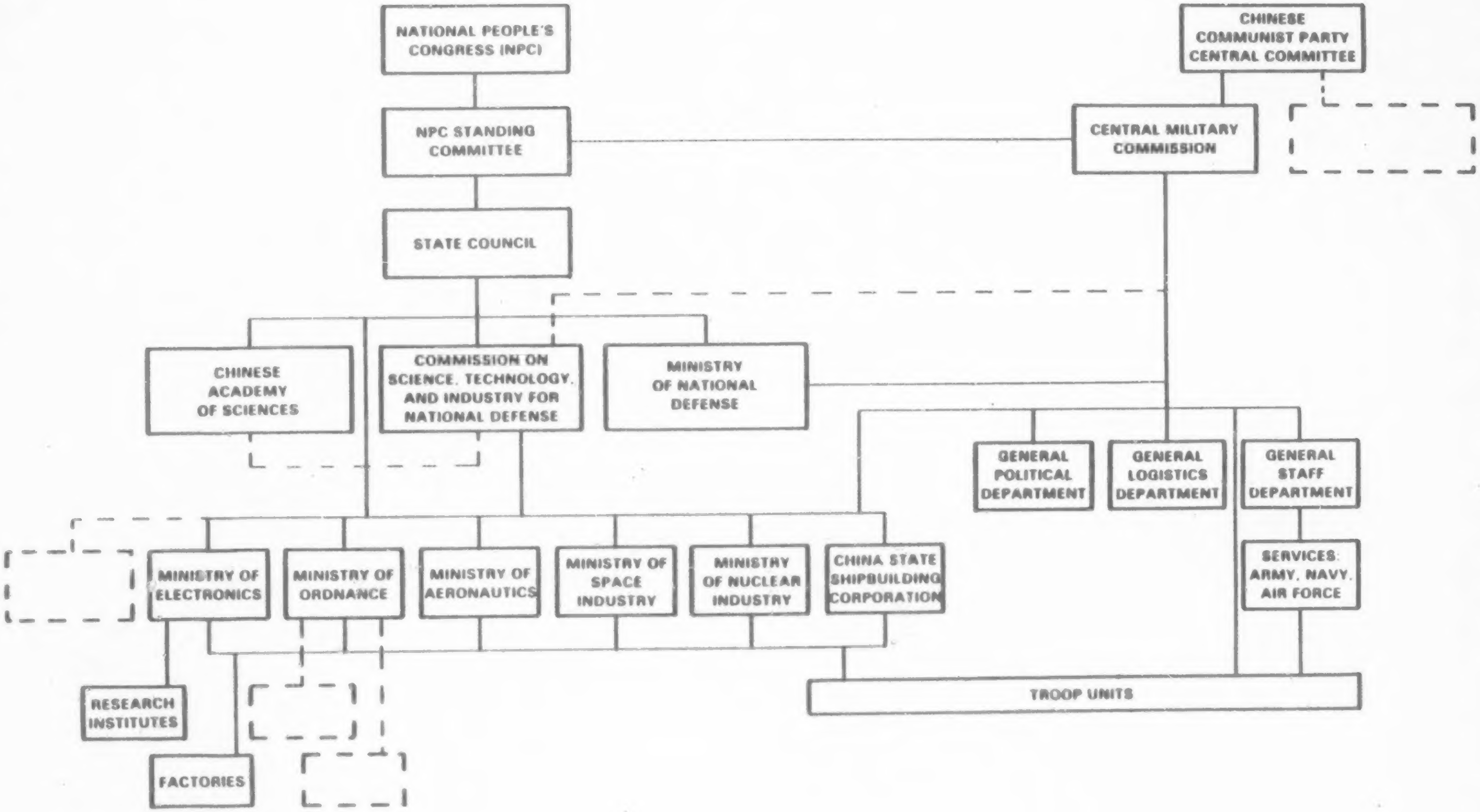
ment, Westview Press, 1983, pp. 43-83; Sydney Jammes, "Military Industry," in G. Segal and W. Tow, eds., Chinese Defense Policy, University of Illinois Press, Urbana, 1984, pp. 117-133; Karen Berney, "Aspects of Modernization," in Segal and Tow, Chinese Defense Policy, pp. 133-148 of Sciences (CAS), for example, generally emphasizes its non-military work in discussions with foreign scientists. Yet it is also known that CAS institutes which have been heavily involved in the strategic weapons program, as well as in research and development for aircraft and electronic warfare. Universities also have laboratories, "workshops," or production lines whose output could contribute to military systems, and certain educational institutions such as the Chinese University of Science and Technology and the Harbin Institute of Technology are known to have close ties to the military.

Although an outsider may have difficulty determining which are civilian and which are military units, there is a planning system which is designed to coordinate the grey area between purely military and purely civilian production. The National Defense Science, Technology and Industry Commission (NDSTIC) is the organization responsible for planning and coordinating the activities of the six MMB's as well as all the weapons-related activities of all the other units involved in military R&D and production. (The relationships among the NDSTIC, the MMB's, and the service arms are depicted in Figure 1.) The NDSTIC is the military counterpart to the State Science and Technology Commission with whose function it overlaps in dual-use areas. It is the NDSTIC's job to ensure that the prototypes resulting from a military R&D undertaking meet the requirements of the end users, the People's Liberation Army (PLA) service arms and branches. The NDSTIC sets output quotas for the MMB's and is a player in major resource allocation decisions affecting military research and development programs.

A key function of the NDSTIC is the supervision of projects and development efforts which require the participation of units from a number of different parts of the bureaucracy. Thus the local NDSTIC bureau in Shanghai, for example, might orchestrate a project involving personnel from a local university, a local


NATIONAL PEOPLE'S CONGRESS (NPC)
NPC STANDING COMMITTEE
STATE COUNCIL
CHINESE ACADEMY OF SCIENCES
COMMISSION ON SCIENCE, TECHNOLOGY, AND INDUSTRY FOR NATIONAL DEFENSE
MINISTRY OF NATIONAL DEFENSE
CHINESE COMMUNIST PARTY CENTRAL COMMITTEE
CENTRAL MILITARY COMMISSION
GENERAL POLITICAL DEPARTMENT
GENERAL LOGISTICS DEPARTMENT
GENERAL STAFF DEPARTMENT
SERVICES: ARMY, NAVY, AIR FORCE
MINISTRY OF ELECTRONICS
MINISTRY OF ORDNANCE
MINISTRY OF AERONAUTICS
MINISTRY OF SPACE INDUSTRY
MINISTRY OF NUCLEAR INDUSTRY
CHINA STATE SHIPBUILDING CORPORATION
TROOP UNITS
RESEARCH INSTITUTES
FACTORIES

NOTE Dashed lines indicate a relationship other than a direct reporting relationship sometimes it is an advisory, sometimes a coordination function

FIGURE 1. CHINESE ORGANIZATION INVOLVED IN MILITARY R&D AND PRODUCTION

institute of the Chinese Academy of Sciences, a factory in the MEI, and a research institute or factory in the Ministry of Aviation Industry. The NDSTIC also plays an important role in China's acquisition of dual-use or weapons technology from abroad. Requests for foreign technology above a nominal dollar-value are forwarded to the NDSTIC by the service arms as well as the MMB's. The NDSTIC must then determine whether or not it is possible to buy the equipment from Chinese suppliers, in which case the foreign exchange can be saved for other priorities.[11] It is reasonable to expect that the NDSTIC, in order to make these decisions, needs to stay informed of the technical capabilities of many Chinese organizations, including those which are not normally dedicated to military activities.

How much power the NDSTIC actually has is not known. Whether, in practice, it is able to collect sufficient information or command resources from organizations outside of the MMB's to play a significant role in non-military activities, is open to question. One area where the NDSTIC is known to be closely involved with a civilian effort is the satellite program. Although the factories performing much of the China's space-related R&D are not overtly military organizations, the NDSTIC operates the satellite launch sites, as well as the tracking and control centers, and therefore plays a pivotal role in the Chinese space program. It is not surprising, therefore, that members of a US space delegation to China last summer were questioned closely on solid-fuel rocket technology that could be directly applicable to ballistic missile development.[12]

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[11] James K. Gordon, "China Boosts Effort to Acquire Technology, Aerospace Equipment," Aviation Week and Space Technology, May 27, 1985, p. 17

[12] See Craig Covault, "Contrasts Across China," and "Austere Chinese Space Program Keyed Toward Future Buildup," both in Aviation Week and Space Technology, July 8, 1985, pp. 11, 19

The information available about China's military production system does not warrant the conclusion that the military is necessarily ubiquitous in Chinese science and industry. It does indicate that in many cases it will be difficult distinguish military from civilian consumers or to know for certain whether the military, often represented by the NDSTIC, is or is not involved in a particular project. The Chinese are clearly in the process of reevaluating the relationship between civilian and military industries, and the system will continue to change until internal debates are resolved.

II. CAPABILITIES AND SHORTCOMINGS OF CHINESE DEFENSE FACTORIES

The preceding discussion established the fact that it is difficult to tell which items sold to China for civilian purposes will be diverted to military uses and which will be restricted to civilian applications. At least some dual-use items will be available to the military. Whether or not that availability constitutes a risk to the US can only be evaluated by examining the level of current Chinese weapons systems and production facilities, the capabilities of China's military-industrial complex to assimilate new technology, and the national security objectives which will dictate the pace and direction of military modernization in China.

This section of the report will describe China's military industry from two perspectives. First will be a discussion of the industry as a whole -- how factories that produce only weapons differ from purely civilian factories. This is followed by a brief assessment of the defense industries based on the weapons they produce.

Although reliable information is sparse, weapons factories appear to differ from civilian factories in two major respects. First, they belong to ministries which are vertically integrated and almost completely self-reliant. The Ministry of Aviation Industry (MAI), for example, has factories that process metal, factories that make machine tools, factories that produce electronic components, and factories that assemble aircraft engines. It has research institutes, laboratories, and schools for training technical personnel. The MAI is not just in the aircraft business; it is involved all the sub-industries and technologies that ultimately contribute to aircraft construction and repair.

Second, many of the individual factories within the MMB's, are themselves quite self-contained. Factories in the MAI and the Ministry of Space Industry have up to 10,000 employees, and produce almost everything they need down to the foundry equipment for forging metal. US aircraft engineers who visited had an official tour of China's largest aircraft factories reported that the Shenyang engine factory has facilities to make the basic tools needed in the metal working and parts fabricating process that precedes the build-up of the sub- and final assemblies. According to one visitor, "They have tool shops that literally make the cutting tools they need to build production tooling and to cut metal. They also make all the screw machine parts they need in the manufacturing process."[13]

Another difference between military and civilian factories is that military factories appear to have been protected from some of the supply problems and uncertainties that plague other consumer-oriented enterprises. For example, factories in light industries receive approximately 40%-60% of their raw materials from the government through a central allocation system at subsidized prices; the remaining 40-60% they must buy from local suppliers at considerably higher prices. Local suppliers tend to be unreliable, and the quality of the materials cannot be guaranteed. It is likely that factories in the MMB's that manufacture only weapons receive closer to 85-95% of the required materials through the central allocation system.

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[13] Jerry Grey, "China Aims for Modern Wings," Astronautics and Aeronautics, Vol. 19, No. 2, February 1981, pp. 56-64; Pierre Condom, "Aviation Expo/China '84: China Awakens to Western Technology," Interavia, No. 2, 1985, pp. 159-161; Craig Covault, "Chinese Design Supersonic Bomber, Plan Joint Efforts to Build Momentum," Aviation Week and Space Technology, July 15, 1985, pp. 61-66

Chinese press reports suggest that the weapons factories in China have for many years not only been given priority supplies, but also the best equipment and the largest number of talented graduates. On the grounds that they have superior technical capabilities, these enterprises are now being encouraged to transfer technology to civilian factories. At a conference last summer the newly appointed Minister in charge of the National Defense Science Technology and Industry Commission (NDSTIC), Ding Henggao, announced that in 1983 there had been 400 "technological items" transferred by the military industry departments to local enterprises and scientific research units, and that in 1984 that number had risen to over 6800.[14]

It is not at all clear from these sources what constitutes a "technological item" (a screwdriver or a numerically controlled machine tool?). Furthermore, specific examples of military to civilian transfer involve fairly primitive technology. Yet the implication is that the military industries have a lot to offer the civilian economy. An article in Jingji Guanli in August 1984 stated:[15]

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[14] Zhang Heping, "Ding Henggao on Transferring Military Technology to Civilian Use and Contributing More to the National Economy," Renmin Ribao (Overseas Edition), 29 September 1985, p. 3

[15] Li Tao, "The Strategic Question of the Arms Industry's Developing the Production of Civilian Products," in Jingji Guanli, No. 8, August 5, 1984, pp. 4-7, translated in FBIS Daily

> The development of civilian products by the arms industry has three advantages: first, the productive capacity is quite large and the equipment is quite complete . . . second, a force of workers exists with great technical abilities; third, quality is stressed, the system is well organized, and there is a great capability to guarantee product quality.

Many Western observers of Chinese industry have reached the same conclusion. In a study of the Chinese metallurgical industry, one scholar has reported:[16]

> The equipment and instruments in the military sector are more modern and complete. For example, the number of pieces of large high-precision equipment and numerically controlled equipment acquired by the Ministry of Ordnance (Industry) far exceeds that of the Ministry of Machine Building. The scientists in the R&D sector have also accumulated considerable experience as evidenced by their successful development of many technologically sophisticated weapons and the new materials and technologies required to produce these weapons.

These generalizations and inferences require careful qualification. First, if China's military industries are "better" than the civilian industries, the critical question is, how much better? Most Chinese civilian industries have not mastered technology that was widely used in the West 10-20 years ago. Is the military ahead by five years, ten years, or fifteen years? How much more qualified are the personnel who work in military factories and research institutes? Did they have access to foreign technical literature during the Cultural Revolution? Did military research institutes hire and train graduate students

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Report: China, September 225, 1984, pp. K11-18

[16] K.C. Yeh, Industrial Innovation in China with Special Reference to the Metallurgical Industry, Rand Note N-2307, Santa Monica, California, May 1985, p. 32

during the ten-year period when all universities were closed? Do they buy more sophisticated equipment from abroad or make it themselves?

Intensive research on a several different industries would be required to required to answer these questions fully. In the meantime, it may be unwise to take the Chinese description of the military at face value. The depiction of the military industries as superior to the civilian economy may well be nothing more than free advertising for the weapons factories so that they will be able to earn additional revenues. Evidence exists, in fact, to support the notion that China's conventional weapons factories are considerably worse off than many purely civilian industries. Foreign visitors to Chinese conventional weapons factories have reported that production techniques are antiquated, discipline is lax, and quality control is non-existent.

The defense industries as a whole appear to have suffered from certain deprivations that have affected them at least as much as their perceived advantages. First, they have been extremely isolated from the outside world, from each other, and from the civilian economy. Political sensitivities and budget restrictions have kept many of the defense industries from scientific and commercial interaction with the industrialized world until recently, whereas their civilian counterparts have been pursuing the "open door" policy aggressively since 1978. Their high degree of vertical integration and a natural tendency towards secrecy may also have kept many of them from a meaningful technical give-and-take with other Chinese factories and research institutes. Their relationship with the civilian economy appears to have been a one-way door, through which people, equipment, and capital went into the military sector, but there was little real cooperation or interdisciplinary work. Chinese officials are aware of the isolation that resulted. One recent article describing the relationship between civilian and military industries concluded:[17]

> We are still far from taking full advantage of the strong points of the defense industry system. . . Due to the closed-style production operations systems which has been followed over a long period, plus the influence of traditional concepts, the defense industry enterprises are still shackled by the conventions of "large and complete" or "small and complete." They have been unable to get going in promoting lateral ties with local civilian enterprises . . .

In addition to encouraging isolation, the healthy subsidies that the central government has provided to the defense industries have kept them from developing the entrepreneurial spirit which results from direct exposure to market forces. This is not to suggest that purely civilian factories in China are operating in a free market environment. However, it is true that over the past several years the Chinese leadership has begun to experiment with a decentralization of decision-making authority and a tolerance of at least limited levels of market competition. This has resulted in more attention to customer satisfaction and greater sensitivity to product design and quality in many civilian industries. It is unlikely that China's defense factories have been able to adopt these reforms to the same degree as, for example, the textile or consumer electronics industries.

China's leaders are now encouraging the defense industries to become more competitive, and may be reducing the degree to which the weapons factories are protected. Selling arms overseas is another way, in addition to selling to the civilian sector, that military factories can earn additional revenues to make up for lost subsidies. Between 1973 and 1983 China earned $4.3

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[17] "Shaanxi Defense Industry Production to be Shifted," FBIS Daily Report: China, April 25, 1985, p. T2

billion from foreign weapons sales; in 1984 alone weapons sales totaled $1.6 billion, for nearly 7% of China's foreign exchange revenues.[18]

The published information on conditions in China's weapons factories does not permit a resolution of the debate about the strength of the civilian versus the military economy in China. It is possible, however, to examine China's weapons inventory for some indication of how far the defense industries have come, and where they are headed. An in-depth technical analysis of Chinese hardware is not within the scope of this report; the following discussion is based on detailed sources that can be referred to for further information.[19]

Most Chinese conventional weapons are based on technology the USSR licensed or sold to China in the early to mid 1950's as part of a massive technical assistance package. When the Soviets abruptly withdrew all support in 1960, they had transferred an impressive amount of manufacturing know-how and hardware, but (perhaps intentionally) they had not trained a strong team of Chinese professionals capable of designing the next generation of weapons.[20] Production equipment and manufacturing processes for the military industries have changed very little since 1960.[21] Chinese engineers have been extraordinarily adept at tinkering with foreign prototypes and making marginal performance improvements. (One China scholar has remarked that the Chinese are the only people in the world who can ruin a new truck in a week and then keep it running for seven years.) They have not been able to design new systems or translate foreign designs into serial production.

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[18] Robert Manning, "New Sellers in Arms Bazaar,: US News and World Report, February 3, 1986, pp. 37-39; Claire Hollingworth, "Your Friendly Chinese Small-Arms Merchant," Wall Street Journal, June 17, 1986, p. 19

[19] See Michael Feazel, "Singapore Marketing Chinese-Built F-7, A-5," Aviation Week and Space Technology, December 17, 1984, p. 21; James Gordon, "Administration Prepares Plan to Sell Avionics to China," Aviation Week and Space Technology, February 3, 1986, pp. 31-32; G. Jacobs, "China's Submarine Force," Jane's Defense Weekly, 9 February 1986, pp. 220-224; G. Jacobs, "China's Navy Moving into Deeper Waters?" Maritime Defense, July 1982, pp. 248-254; Jane's All the World's Aircraft, Jane's Fighting Ships, Jane's Weapon Systems; Harlan Jencks, From Muskets to Missiles, Westview Press, Boulder, Colorado, 1982; William Kennedy, "The Defense of China's Homeland," in Ray Bonds, ed., The Chinese War Machine, Salamander Books, London, 1979; Kenneth Munson, "Fishbed, Finback and the Chinese Future," Jane's Defense Weekly, 21 December 1985, pp. 1367-1369; Christopher Stowell, "China's Defense Market Comes of Age," International Defense Review, 12/1985, pp. 1919-1924; Bill Sweetman, "The Modernization of China's Air Force," in Bonds, ed., The Chinese War Machine

China's fighter program is a good example of this "modify-a-foreign-prototype" approach to weapons development.[22] China began producing fighters in 1956, with Soviet assistance, at the Shenyang Aircraft Factory. The first plane, the J-5, is a Chinese version of the Soviet MIG-17, and its engine is a Chinese-manufactured copy of the Soviet Klimov VK1A turbojet engine. Neither is in service in the USSR today. In 1966 the Xian Aircraft Factory began serial production of the J-6 after importing a prototype, blueprints, and technical assistance from the Soviets in 1958 and 1959. The J-6 (also known as the F-6) is identical to the MIG-19 in most respects. The Soviets stopped producing MIG-19 in the late 1950's. The Chinese have manufactured seven different versions of this aircraft, each with slight modifications to the fuselage, radar or armament. The J-6B, for example, is armed with "Alkali" radar-homing missiles; the J-6Xin features a Chinese-designed airborne interception radar. The training version, the JJ-6, has an elongated fuselage and a pneumatically deployed braking parachute, both of which distinguish it from the Soviet MIG-19UTI. The most advanced version, the JZ-6, is believed to be capable of Mach-2 speed, contains a Chinese-designed IFF radar, and can carry two ATOLL air-to-air missiles. In good flight conditions, the Chinese JZ-6 can outperform the MIG-19. Yet the plane cannot fly at all in poor weather, it has propulsion problems resulting from excessive weight, and its navigation and weapons-aiming subsystems are both antiquated.

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[20] Chu Yuan Cheng, The Machine Building Industry in Communist China, Aldine, Chicago, pp. 9-16

[21] See Hans Heymann, "China's Approach to Technology Acquisition: Part III - Summary Observations," Rand Report R-1575-ARPA, February 1975, esp. pp. 4-12 and 28-31 for a discussion about the limits of Soviet assistance

[22] See Kenneth Munson, "Fishbed, Finback" and Jane's All the World's Aircraft

The Q-5 fighter-bomber, also based on the MIG-19/J-6, features a lengthened fuselage, a larger fuel tank, a slightly redesigned engine, and a redesigned nose, presumably to accommodate a more sophisticated radar (although none has been observed). The Q-5 (also referred to as the A-5 and the F-6bis) was designed in the late 1960's. The J-7 is a Chinese version of the MIG-21 which entered production in the early 1960's. Production stopped during the Cultural Revolution, but resumed in the early 1980's, with several modifications, of which one was the addition of modern avionics (purchased from GEC in the UK). The Chinese designed-engine has also been improved to reduce the time between overhauls, and a 30 mm Type 30-1 gun has been added to the armament. The Chinese are still trying to get the J-8 (also known as the F-8) into serial production. The few J-8's that have been observed resemble a modified Soviet MIG-21. The prototype has been modified several times since it was first reported in 1979, and Xinhua reported a successful test flight in May 1984. China is considering buying a US avionics package for this aircraft which would considerably improve its performance, however the Chinese still need an engine powerful enough for a take-off weight of 20,000 kg.

Another example of incremental modernization is the submarine program.[23] China has six classes of submarines in service: the Whiskey, the Romeo, the Ming, the Han, the Golf, and the Xia. The earliest of these, the Whiskey was produced with prefabricated parts and technical assistance from the Soviets. The Whiskey class entered production in 1956 and differs from the Soviet version in that it lacks the Soviet electronic countermeasures (ECM) and electronic support measures (ESM) which the USSR was presumably unwilling to export. After Soviet advisors left China in 1960 it took the Chinese two years to begin production with Chinese-made components. China built 21 Whiskey submarines. The Whiskey is a patrol submarine with 35-40 days' endurance and an operating radius of 2300-2400 nm from its operating base, adequate for coastal defense. Production of the first Romeo class sub was not completed until 1964. The USSR had provided blueprints and technical documents prior to 1960 but probably did not deliver any finished components. China has 95-98 Romeos in service and produces two new subs a year. The Chinese Romeo differs from its Soviet design, now 30 years old, in that it rides higher in the water and it, too, lacks Soviet ESM. Its operating radius is 1750 nm, wide enough for it to operate in the Bay of Bengal. Both the Whiskey and the Romeo are comparable to the first generation US "Guppy" remakes of World War II-era diesel electric submarines.

The Ming class of submarines was an unsuccessful Chinese attempt to improve on the Romeo in the mid-1960's. The program was cancelled in the early 1970's and not many details about the Ming are available. It may feature a different engine and shaft/rudder combination comparable to that on the Soviet "November" class. By 1975 it was clear that a new design was beyond the capability of shipbuilding industry and the four major shipyards all reverted to production of the Romeo class subs.

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[23] G. Jacobs, "China's Navy Moving," and "China's Submarine Force"

China began research for a nuclear powered submarine in the early 1960's, with the help of Western open source literature about water-cooled reactors. The first nuclear powered submarine, the Han, was launched in 1971 but probably not operational until 1974 or 1975. Three are now operational; two more are being built. China's first ballistic missile submarine, the Golf, is similar to its Soviet prototype. The one Golf now in service was built at the Luda shipyard in 1964. The Xia class ballistic missile submarine was first identified in 1983 and is comparable in size to the British Polaris submarine. It is outfitted with 12 or 14 CSS-NX-3 SLBM's. One Xia is operational and a second is reported to be near completion.

Although the Chinese developed the Xia class with minimal foreign assistance, production levels are likely to remain low. There are still problems with the nuclear power plant, and the sonars and guidance systems are antiquated compared with those of the US or the Soviet Union. Chinese engineers have talked with British and French firms about replacing the diesel electric propulsion systems on the Whiskey and Romeo class subs with modern Western plants, indicating that mass production of the Xia class is at least several years away.

Other areas of conventional hardware such as ground and naval radars, surface-to-air missiles, coastal defense missiles, rifles and attack guns, anti-tank missiles, bombers, destroyers and frigates share this development pattern. The Chinese are capable of mass producing enormous numbers of conventional weapons, yet they are using largely outdated production equipment and techniques to manufacture obsolete models. These weapons are not necessarily useless; the defense industries have been selling aircraft, tanks, rifles as well as submarines and other naval vessels to third world countries for the past three years. Arms exports do not solve the underlying problems in the defense industries, however. This can only be accomplished through purchases of finished weapons systems from abroad, imports of manufacturing equipment and expertise to support modern weapons production, and indigenous development of new systems. China's need for advanced conventional weapons is hardly debatable; the most efficient way of acquiring them, given limited resources, is still open to question.

China's ballistic missile and satellite capabilities stand in contrast to the unimpressive performance of the conventional weapons industry. One of the questions most often asked about Chinese modernization is why the Chinese have the ability to build an ICBM force with only limited foreign assistance and not the ability to manufacture consumer electronics that meet international standards. One answer can be found in the history of the strategic missile program, which is inseparable from the satellite program. Nuclear research began in 1957 at the Institute of Physics in Beijing, under the terms of a bilateral agreement with the Soviet Union by which she was to "provide China with a sample of an atomic bomb and technical data concerning its manufacture. The Soviets reportedly tore up the agreement two years later when Sino-Soviet relations began to cool off. China continued the nuclear program without foreign cooperation and PRC scientists and engineers made large strides entirely on their own.[24] China exploded a 20-kiloton atomic bomb in 1964, and a megaton-range thermonuclear weapon in the summer of 1967. Thus, China made the transition from fission to fusion in less than three years, which was an impressive achievement for a country whose technological infrastructure had been in a shambles fifteen years earlier.[25] Since 1967 China has deployed intermediate range ballistic missiles, intercontinental ballistic missiles and has tested an SLBM.

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[24] Yuan Li Wu and Robert Sheeks, The Organization and Support of Scientific Research and Development in Mainland China, Praeger, New York, p. 365

These achievements display a level of scientific and engineering prowess considerably beyond those of the tank or military aircraft industries. They also suggest that the nuclear weapons program has enjoyed certain advantages over the conventional weapons factories. The realization that foreign assistance would not be forthcoming was the incentive needed to make nuclear weapons development a priority area. The advantages enjoyed by the nuclear program probably included budgetary priority, protection from political upheavals and access to foreign technical literature during the Cultural Revolution, and the dedication of the country's top scientific and technical personnel.[26]

The defense sector thus appears to have developed "pockets of excellence" many of which are connected to the satellite or missile program (both run from the Ministry of Space Industry or MSI). It is known, for example, that in 1965 a department within the CAS Institute of Electronics was spun off as a separate factory and turned over to the Ministry of Space Industry. It is now called the Lishan Electronics Factory and it is responsible for a range of military electronics. Foreigners who have visited it report that its clean room is comparable to modern facilities in the US or Japan, and that it has a "world class production line." Information on other advanced production lines is slowly becoming available; several others are also outgrowths of CAS institutes. It would be a mistake to conclude, however, that all facilities within the Ministry of Space Industry are necessarily more advanced than those in the MEI or the Ministry of Aviation Industry. The "high end" of MEI capability, for example, is almost certain to be higher than the "low end" of the MSI.

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[25] Jencks, Muskets to Missiles, p. 196

[26] It is likely that at least some parts of the Ministry of Space Industry had access to foreign technical literature even during the Cultural Revolution. See, "How US Science Got to China Before '79," The New York Times, May 27, 1986, p. A20

Although it is possible to generalize about the management and organization of China's weapons factories, and to evaluate the quality of the hardware they produce, this section has made it clear that big differences in sophistication and capability exist within and among the six MMB's. The sharpest contrast is that between the strategic and the conventional weapons factories. Production of conventional weapons in China is an antiquated process that results in antiquated hardware. China is still relying largely on foreign designs from the 1950's and has experienced great difficulty moving to serial production of a new generation of weapons. The strategic program, on the other hand, represents a concentration of talent and capital investment that has shown impressive results. Over time it may be possible to identify specifically those units directly involved in it and in other similar high end programs.

III. THE CAPACITY OF CHINESE WEAPONS FACTORIES TO ASSIMILATE FOREIGN TECHNOLOGY

The preceding section argued that China's conventional military factories are considerably behind those of the US and the Soviet Union in management, production know-how, and quality of finished products. But will foreign technology make a difference to the defense sector? This section analyzes the degree to which Chinese weapons factories will be able to use effectively the foreign equipment they purchase in an attempt to catch up with the West.

As noted above, China's defense industries represent a range of technical capability, from tank production, which appears to be quite primitive, to the ICBM program, which is remarkably sophisticated. The same range no doubt exists when it comes to the ability to assimilate foreign technology. Whether or not a specific transfer is likely to result in an improved weapon system depends on the particular factory involved in the transaction, the transfer mechanism, the sophistication of the Chinese personnel involved, and so forth. This makes generalizations extremely difficult.

At the same time, it is possible to look at the historical record and ask, what has been the experience of China's weapons industries in exploiting foreign technology? The military industries provide rich material for studying technology transfer because many PLA weapons were developed with some form of foreign assistance. China's entire industrial structure for military production was established in close consultation with Soviet experts in the early 1950's and was closely modeled on the Soviet administrative system. Between 1953 and 1960 the USSR sent over 11 thousand specialists and technicians to China; these experts were involved in every phase of China's military and civilian industrial production, from basic R&D to prototype testing and serial production.[27] The influence of Soviet design can be seen everywhere in Chinese weapons now in the inventory; most models declared to be of Chinese design are, in fact, Soviet systems onto which PRC engineers have grafted Chinese-designed or foreign components. A 1984 study concluded that all of Chinese conventional weapons fit into one of five categories: Chinese designed weapons which incorporate features of foreign systems, reverse-engineered systems, modifications of Chinese or foreign prototypes, weapons produced under license to the USSR, and foreign captured systems still in use.[28]

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[27] Chu Yuan Cheng, "Growth and Structural Changes in the Chinese Machine-Building Industry, 1952-1966," China Quarterly, No. 41, January-March 1970, pp. 26-57

The discussion of fighter aircraft and submarines in the preceding section stressed the reliance on foreign prototypes. Another example of a military industry where foreign assistance has been especially influential is Chinese tanks and armored personnel carriers (APC's).[29] China's inventory now includes three tank models (the T-69-I/II, the T-59/upgraded T-59, and the T-34/85), and two APC's (the T-77, and the YW-531). In addition China has recently developed an infantry fighting vehicle, labeled the WZ-501. China imported the T-59 from the USSR in 1950 and initially manufactured it with Soviet assistance under the Sino-Soviet friendship treaty; the T-34/85 was provided several years later. In 1969 PLA ground forces captured a Soviet T-62 medium tank which was the model for the Chinese T-69, the one main battle tank now in production. The new infantry fighting vehicle is believed to resemble closely a model the French began producing in 1975, suggesting a reverse engineering effort. The Chinese have made some important modifications to foreign tank models; they have added laser-range finders, night vision, a 105 mm gun system, and new tracks for added protection against anti-tank guided missiles and RPG's. The PLA now has 900-9500 tanks in service. China produces approximately 1700 T-59s and T-69s a year, a significant increase from 700 a year in 1978.

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[28] Wendy Frieman, "Foreign Technology and China's Weapons Acquisition Process," SRI International Technical Note, December 1984

[29] Christopher F. Foss, "Chinese Weapons Revealed," _Jane's Defense Weekly_, May 10, 1986 and "Chinese Type 69/II MBT Details Revealed," _Jane's Defense Weekly_, February 8, 1986, pp. 205-207; G. Jacobs, "Impressions of China's Long-Range APC," _Jane's Defense Weekly_, March 9, 1986, p. 401; "China's Type-59 and -69 MBT's," _Jane's Defense Weekly_, July 27, 1986, pp. 171-174; and "China's Tank Armies," _Jane's Defense Weekly_, February 1, 1986, pp. 159-161

The APC industry is similar to the tank industry. The USSR provided China with APC prototypes as well as some manufacturing assistance in the early 50's, before the Sino-Soviet split. The recently displayed Chinese APC, the YW 534, appears to be a copy of the French SIBMAS fire support and apc vehicle, although it is not known that China ever received a French prototype. China has an in-service inventory of 2500 APC's and now manufactures close to 500 a year. This is a five-fold increase since 1978, however the inventory is still not sufficient to equip all the PLA's main force divisions.

Foreign prototypes, technical data, and manufacturing assistance were therefore instrumental to this industry. The Chinese relied heavily on foreign technology and appear to have been successful at assimilating it. But the cost was high. The reverse engineering process took years before serial production could begin, and ultimately the transfer of hardware and manufacturing know-how did not enable the Chinese to design a new generation of equipment incorporating recent technological advances. The result is that Chinese tanks and APC's are only marginal improvements of 1940s and 1950's models used by the USSR and the US. Chinese engineers have grafted on to these systems some relatively up-to-date accessories but they are still vastly inferior to modern Soviet or US tanks.

China had similar experiences with other categories of conventional weapons, including fighters, bombers, destroyers, and infantry weapons. The transfer of foreign technology in the 50's and early 60's was successful, in that Chinese factories are now capable of manufacturing large numbers of these items, however the rest of the world has moved ahead while the Chinese have stayed with 15-20-year old designs.

The tank/APC example has two important limitations. First, it is historical; the transfers took place over 20 years ago.

Second, it examined the transfer of weapons technology rather than on the military's ability to use sophisticated dual-use equipment, such as computers. Only one case of dual-use transfer to a military factory has been reported, and this is the now well-known transfer of Spey engine technology to a military aircraft factory in Xian. This project included Chinese purchases of manufacturing equipment as well as training and technical data for the Rolls-Royce Spey engine. It was an expensive project for the Chinese and was seen as a landmark dual-use transfer experiment. The factory ran into difficulties shortly after the cooperation began, and many of them were never resolved. The Xian plant never began serial production (the 6-10 engines produced were hand-crafted), and it is now no longer manufacturing the Spey engines at all. Among the major problems in the transfer were poor management, cumbersome administrative procedures which resulted in lengthy delays, and China's inability to process the aluminum to the required standards. The transfer was unsuccessful in that the Chinese never really absorbed the Spey technology so that they could manufacture and install their own engines.[30]

The historical record of the defense industries in assimilating foreign technology permits two conclusions: First, that Chinese military industries have successfully assimilated foreign technology, but the process was costly and time consuming; and second, that the one example of a recent dual-use transfer to a military factory was unsuccessful for a variety of technical and managerial reasons none of which seem to be unique to the Xian engine factory.

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[30] Denis Simon, "China's Capacity to Assimilate Foreign Technology: An Assessment," in China Under the Four Modernizations, US Congress, Joint Economic Committee, Government Printing Office, pp. 534-535

The record of transfers to the military sector in the past need not determine future events. China's military industries may, in the future, be able to acquire and absorb foreign technologies over several years rather than several decades. Three major factors will determine the chances for success of any given transfer: the ability to select appropriate technology, the availability of complementary inputs, and the assignment of quality personnel to the project. Chinese civilian industries have found it difficult to meet all of these requirements, and it is worth asking whether or not the military sector will fare any better.

The ability to select technology appropriate for a given enterprise requires sound judgement and a willingness to forgo expensive, state-of-the-art equipment for less glamorous items that will often do the same job. China's recent preoccupation with the "world technological revolution" has resulted in an infatuation with high technology as a panacea to all economic woes when, in fact, it is extremely doubtful that Chinese factories have carefully planned exactly how they will use the equipment they import. One Chinese author charged that [31]

> The state management currently in existence is generally confined to project examination and approval and becomes downright superficial in such important areas as absorption. . . We have an import plan, but no absorption plan. We emphasize the import of equipment, and ignore that of technology. The scientific and technical development plans of the science and technology commission are divorced from the import plan of the economic and planning commissions. . . As things now stand, the dire shortage of funds and foreign exchange for technology absorption is primarily caused by their misuse.

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[31] Chen Jingcheng, "Problems in Technology Absorption" Fujian Luntan, July 5, 1985, pp. 13-16, translated in JPRS-CST-86-013 China Report: Science and Technology, April 14, 1986, pp. 14-19

Thus it is no surprise to find that much of the computer equipment and peripherals China has imported go unused because the recipient organizations lack the necessary personnel, software, air-conditioning, or power supplies. A related problem is the reckless desire for anything foreign, regardless of whether it is necessary or appropriate. The commentator from Fujian Luntan also points out: "Some joint ventures spend foreign exchange importing such things as banisters, doorknobs, and screwdrivers. Others are even more irresponsible, insisting that even their sofas. . . be foreign made."[32]

The lure of foreign technology seems to be particularly great for the defense industries. China's military industrial complex is now represented by a myriad of defense procurement companies such as NORINCO, Polytechnologies, Yanshan, Xinshidai, and so forth, some of whose personnel are quite technically sophisticated. The problem, therefore, is not necessarily the inability to make a rational technical analysis, but the inability to stick by a rational decision in the face of pressures to import high-technology items that carry more prestige. It may also be that some military factories which have had only limited exposure to the West tend to underestimate the gap between Chinese and Western technology and stress "self reliance," thereby also underplaying the complexity of the technology assimilation process.[33] This tendency was common in many civilian industries in China when they first began commercial contacts with the West in the late 1970's. An inability to assess how far behind the Chinese were in engine manufacturing techniques may well have contributed to the failure of the Spey project.

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[32] Chen Jingchen, "Problems in Technology Absorption"

[33] Roger Sullivan of the National Council for US-China Trade reports, "the defense industry . . . is repeating the behavior pattern of China's civilian sector a few years ago by exaggerating its ability to absorb and apply advanced technology." See Roger Sullivan, "US Military Sales to China," China Business Review, March-April 1986, p. 9

A second factor will be the ability of weapons factories to provide the complementary inputs required for successful assimilation. These inputs will vary considerably with each technology, but they could include energy supplies, high quality steel or alloys, sophisticated instrumentation for test and evaluation, or quality control equipment. It is impossible to generalize about all of China's military factories, but it is highly likely that certain areas of the military complex, such as the nuclear program, do enjoy access to superior equipment, and most defense factories probably have priority claims on raw material and energy supplies. The high degree of vertical integration in the defense factories could also be an advantage in that many factories will not have to go outside for components or subassemblies. This contrasts with civilian factories which often have a complex and bewildering array of supplier and subcontractor relationships. However vertical integration could also be a limiting factor. If the weapons factory in question does not happen to manufacture the specific materials or component required for a foreign system, it may be more difficult to identify likely suppliers. In sum, complementary inputs may not be as much of a problem as they appear to have been for the civilian sector, but they cannot be assured for military factories.

The third key factor is the quality of the technical and managerial personnel at the enterprises acquiring the technology. Here, too, it is difficult to generalize about all defense production, as the best personnel are working in "pockets of excellence." Yet these pockets are small and few in number; the highly trained personnel cannot be everywhere at once. This is the fallacy in the "China can do anything it wants to" argument that is often used to explain the success of the ballistic missile program. The Chinese can direct all their talented people to a priority project, but they cannot do that for every project simply because the supply is limited. The need for more scientists, engineers and technicians in the military-industrial complex is underscored by the Chinese leadership's current emphasis on raising the technical level of personnel employed in the defense industries and on establishing an S&T infrastructure within each of the PLA services. Thus the military industries may have access to more capable personnel, but there are no assurances that they will be assigned to work on any one project or in any one factory.

Ultimately it appears that the military does bring unique advantages to the technology assimilation challenge. However, the historical record and the serious systemic problems still facing the defense industries suggest that success is far from a foregone conclusion.

V. CHINA'S NATIONAL SECURITY OBJECTIVES

The first four sections of this report have examined the type of weapons-related technology China has been (and is likely to continue) importing, as well as the capabilities and shortcomings of the PRC military-industrial complex. This information is useful only in the context of China's national security objectives and specific plans for achieving those goals. Is foreign technology contributing to the development of capabilities that China will use to threaten the US or its interests in Asia?

Before addressing the substance of China's national security objectives, it is critical to address the role of defense relative to other sectors in China's economic planning. The Chinese announced in 1978 that national defense was last of the "four modernizations" (the other three being: agriculture, industry, and science and technology). Many Western observers of the Chinese scene have reiterated this viewpoint to the extent that it is now part of the accepted wisdom about Chinese military modernization. Chinese as well as Western statements warrant more careful scrutiny. It is counter-intuitive, if not irrational, that any sovereign nation would place national defense at the bottom of its list of priorities. Preservation of national security is a primary function of most governments, and China is no exception. The earlier sections of this paper have pointed out that weapons procurement by the central government has fallen off in recent years, and that the defense sector is losing some of the privileges it enjoyed during the past 30 years. The military may no longer be Number One. However, that does not mean it is number four, or that China's leaders view defense modernization as insignificant.

On the contrary, it appears that the post-Mao leadership has questioned the most fundamental assumptions underlying Chinese defense policies during the 1960s and 1970s, especially in light of a new relationship with the US and a changing Sino-Soviet balance. A new strategic doctrine has not yet emerged, probably because of continued debate within the leadership. Nor has China articulated a clear cut set of national security objectives that can be easily correlated with mission areas and hardware requirements Nevertheless, the emergence of the national security studies field in China has resulted in discussions of defense policy in the open press as well as opportunities for foreign national security experts to exchange ideas with their Chinese counterparts. Thus, after nearly a decade of silence, there is now a body of foreign secondary literature on Chinese defense policy in the post-Mao period.

Threat assessments will influence China's military objectives, and much of the literature about national security studies in China focuses on Chinese evaluations of external threats. A careful reading of that literature suggests that several overriding concerns dominate the agenda.[34] The first of these is a large or small-scale Soviet invasion. The USSR, despite an on-again-off-again neutralization of hostilities, still has one million troops, many in mechanized divisions, stationed on the Sino-Soviet border, where the Soviet technical advantage will continue well into the 1990s. The Chinese would clearly like to shift the balance in their direction. Although this is the paramount threat, the gap between Chinese and Soviet forces is so great that a change in favor of the PRC will take at least a decade. In the meantime, other objectives may be easier to achieve. One is the desire to be able to use military force, if necessary, near the Sino-Vietnamese border, more successfully than in 1979 or 1981. A third concern is the protection of the Bohai and Liaodong Gulfs in the event that the Soviets attempt to enter the Yellow Sea and land troops in Tianjin or on the Manchurian Peninsula. China would also like to be able to protect its island claims and offshore oil bases in the South China Sea. Finally, the leadership in Beijing would like to have the option of using force to regain Taiwan, even though at the moment the political, military, economic, and diplomatic costs of such an undertaking appear unbearably high.

This is a substantial agenda and, if the PLA were determined to meet the technological level of its adversary in each of these cases, one that would require either a greatly improved indigenous weapons industry or massive foreign imports. In practice, China probably does not expect to be able to match the technological level of its opponents in the near-term and appears willing to settle for a more modest program. Developments over the past five years suggest that the PLA will pursue an incremental approach to hardware modernization and, in an era of tight funding, concentrate on areas other than hardware that require little capital investment. Thus it is reasonable to expect continued improvements in the PLA's Strategic Rocket Forces, with an emphasis on the transition from liquid to solid fueled ICBM's, the continued development of a multiple independent reentry vehicle (MIRV) warhead, and gradual improvements in China's emerging SLBM capability. The possibility of an air battle will force attention to air defense radars and avionics for China's outdated fighters and bombers. Concerns about China's territorial waters and a growing Soviet naval threat in the Pacific will reenforce the trend toward a limited blue water (as opposed to a purely coastal defense) navy. The Vietnam incursion in 1979 has already brought home lessons about improving a number of Chinese tactical systems, specifically the surface-to-air and anti-tank missiles that were in part responsible for an inferior performance by the PLA's ground forces in that encounter.

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[34] See, for example, Paul Godwin, ed., The Chinese Defense Establishment, Westview Press, Boulder, Colorado, 1983; Godwin, "Soldiers and Statesmen in Conflict," in Samuel Kim, ed., China and the World, Westview Press, Boulder, Colorado, 1985; Ellis Joffe, "Party and Military in China: Professionalism in Command?" Problems of Communism, September-October 1983, Vol XXXII, pp. 48-63; Gerald Segal and William Tow, eds., Chinese Defense Policy, University of Illinois Press, Urbana, 1984; Gerald Segal, Defending China, Oxford University Press, 1985; Robert Wang, "China's Evolving Strategic Doctrine," Asian Survey, October 1984

Until the Chinese articulate a coherent military strategy it is impossible to rank order these objectives or to translate them into requirements for specific weapons systems. Nor is it certain that this list is complete. It does appear, however, that if the Chinese are pursuing the approach to military modernization outlined above, the US does not face any near-term security risks, either for itself or for its allies in the region. Chinese resources will be allocated among the defensive, not offensive, needs that are believed to be the most pressing, none of which can be satisfied overnight in any case.

It is always possible that the political wind will change, and that China will begin to target resources on one specific mission, which would result in rapid progress and the emergence of a new offensive capability, as opposed to incremental change in defensive capability. This is unlikely for several reasons. First, the defensive needs are great, and China ignores them at great cost. Second, there can only be one or two "big push" programs; resources (especially trained personnel) are too limited to permit an intensive effort in many areas simultaneously. It is difficult to identify any one area where dramatic improvements would justify neglecting other missions. China has not (despite much rhetoric to the contrary) pursued an intensive development strategy for the civilian economy , and such an approach is equally unlikely in the military industries. Third, many within Chinese military establishment appear committed to strengthening the technology infrastructure that will be needed to support modern weapons production before attempting to manufacture sophisticated systems. Defense Minister Zhang Aiping is one proponent of this strategy. At a speech given in 1982 he said:[35]

> The results of economic construction are the material foundation for national defense construction and the actual strength of the national defense. If economic construction is not managed well, strengthening the national defense construction is out of the question. Thus, in normal times we must cut the expense of national defense as much as possible in order to ensure that economic construction can develop at a greater pace.

This is a goal which several US defense experts who have studied China endorse, yet achieving it will not be easy.[36] The

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[35] "Zhang Aiping on the New Constitution," Zhongguo Xinwen She, translated in FBIS Daily Report: China, December 14, 1982, pp. K62-63

[36] Hearings before the Subcommittee on Asian and Pacific Affairs of the Committee on Foreign Affairs, House of Representatives, The New Era in East Asia, 97th Congress, 1st Session, June 10, 1981, pp. 270-271

Chinese will have to undertake a complete overhaul of the electronics and metallurgical industries, a process that has begun but will take at least another decade, even according to Chinese projections which are often overly optimistic. In the meantime, others within the defense establishment are eager to import modern weapons; thus selected military purchases will probably complement the upgrading of the infrastructure. However limited cash is available and here, too, improvements in capability are likely to be incremental.

Improvements to PLA hardware, moreover, constitute only one component of a comprehensive defense modernization program. Existing doctrines emphasizing guerrilla tactics and a protracted war in China's interior until the enemy is exhausted will have to be modified. Air, ground, and sea forces will have to be able to coordinate activities across and within military region and military district lines. Combined arms operations are not part of the PLA legacy from revolutionary or Korean War days. The need to integrate the service arms, rather than rely on their individual capabilities, extends to the highest levels of the PLA command structure. Recent military exercises indicate that Chinese officials are beginning to address these issues and tackle them head on, despite the problems that reorganizing an army of million soldiers will present.

Other impending changes include the strengthening of training and education for PLA officers and soldiers, the establishment of an S&T infrastructure within the services, and the streamlining of the PLA to keep it "mean and lean."
The PLA's educational system has seen important reforms over the past five years. Military colleges, closed during the Cultural Revolution, have now been reopened and have strengthened their entrance and their graduation requirements. The Doctoral degree for military science was established in 1983 to encourage advanced research by PLA officers. The PLA as well as the

Chinese Academy of Social Sciences have founded "think tanks" which address military-strategic problems. All ranks of the PLA are now encouraged to acquire a technical education by whatever means available, and some military personnel are relieved from regular duties to attend classes in mathematics, computer science, engineering and physics. Stiff technical requirements are now built into the PLA's personnel screening, and college graduates in technical fields are being aggressively recruited.

The reduction of PLA forces is an overwhelming task. In 1985 Hu Yaobang, Party Chairman, announced that China's army would be cut by one million men over the following two years. This amounts to slightly over 25% of the PLA and represents a significant change, as the size of the PLA has been growing steadily since the mid 1960's. The reduction will consist of retiring senior personnel, cutting back the size of some combat forces, and transferring certain units now under military jurisdiction to civilian units. For those who remain in the PLA, military ranks and a trend towards professional military standards will be required. Ranks were abolished during the Cultural Revolution in an attempt to promote egalitarian thinking, however the new rank system detailed in the Military Service Law of 1984 reflects a more formal hierarchy. This system has yet to be implemented.[37]

In conclusion, China is now pursuing organizational reforms that are equally as important as weapons modernization, but that do not require large capital investment. The coming years will see a limited program of defense hardware improvements, based on incremental growth for defensive missions and improvements to the industrial infrastructure. None of this indicates that the Chinese have downgraded the modernization of national defense.

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[37] Asian Security, Research Institute for Peace and Security, Tokyo, 1985, pp. 78-81

The leadership is making investments that will pay off for the defense industries in the future, perhaps not until ten or 15 years from now, assuming that the modernization of the civilian economy proceeds smoothly. The spillover of an improved civilian scientific and technical base to the defense industries and research laboratories will be not be easily identifiable; in all likelihood it will be as difficult to detect for China as it was for the Soviet Union.

VI. THE RELATIONSHIP OF CHINESE IMPORTS OF DUAL-USE TECHNOLOGY TO MILITARY MODERNIZATION

The previous section argued that imports of foreign technology are only one component in China's approach to military modernization. China is pursuing two simultaneous strategies: first, the upgrading of the industrial infrastructure so that it can support modern weapons production; second, the negotiation of a few selected purchases of military hardware and technology to make near-term improvements to existing systems. Dual-use technology imports that are sold for civilian purposes may well benefit the military in the long term, but it is impossible to detect their influence on weapons modernization in China over the past five years. It is impossible to know if, for example, the 1985 purchase of image processing technology from the Canadian firm Dipix for $2 million has actually resulted in improvements in Chinese search and surveillance capabilities. If there had been significant changes in Chines surveillance, moreover, it would be extremely difficult to know whether or not those changes were the result of diverting dual-use technology from civilian to military applications.

There have been several dual-use sales in which a Chinese military customer was identified, such as the Sikorsky helicopters or the proposed GE gas turbine engine, but these have been limited in scope and few in number, and have not altered

China's overall defense posture or defense industrial base. Observable changes in PLA hardware are much more likely to be the result of purely military rather than dual-use transfers; in the past most have been modifications to weapons that are being built for export. Recent improvements to China's F-7 fighters, for example, have consisted of replacing outdated Chinese avionics with a GEC HUDWACS (head-up display and weapon-aiming computer system), a GEC Skyranging radar, and a GEC AD 3400 VHF/UHF communications radio. The new Chinese T-69/II tank is outfitted with an Israeli-made laser range finder. In a similar vein, NORINCO has recently signed a contract with Vickers to coproduce an infantry combat vehicle that will incorporate a British turret and modern armament system. (Table 4 in Appendix A lists recent Chinese imports of military technology).

The tenuous connection between dual-use imports and an improved military capability results in part from the large gap that separates many Chinese defense factories from their Western counterparts. According to Western defense contractors who have toured Chinese weapons factories, the Chinese would need to completely rebuild and restructure their factories in order to manufacture modern systems. They are not missing simply one piece of equipment, such as a numerically controlled machine tool.

What they lack is a range of skills from inventory control and quality control to precision grinding and milling techniques. Chinese defense procurement companies do not appear prepared, however, to purchase integrated packages that include production equipment as well as documents and training. For the moment, they believe that they can buy selected components and perform the integration and reverse engineering themselves. The record to date suggests that whereas this approach may yield marginal performance improvements, it will not result in a modernization of the industry as a whole.

This point is underscored by considering the effects of the hypothetical transfer of two pieces of equipment to China: one is a supercomputer, and one is a laser gyroscope. Both of these cases would strain the limits of the current export control regulations, as many questions remain about exactly what Chinese end users would be able to do with the equipment. What follows is not a detailed technical analysis of Chinese capabilities, but rather some speculation on the issues Chinese engineers and technicians would have to cope with in using these pieces of equipment, and in making the transition from using them for civilian purposes to using them for military purposes.

In assessing the effect of selling dual-use high-technology items to China, the policy-maker must consider two technical issues:

1. In principle, how might the availability of the dual-use item help the Chinese to improve their military capability?
2. In practice, what technical obstacles are the Chinese likely to encounter in attempting these improvements?

The beginning of this section drew attention to the crucial distinction between the acquisition of finished products and the acquisition of the knowledge and equipment necessary to make those finished products. The cases that follow consider transfers of finished products, along with only that amount of training and support necessary for use of the items. The effects of these transfers on military capability could be indirect and subtle, and difficult to detect.

Laser Gyroscopes. In 1983, the Civil Aviation Administration of China (CAAC) purchased several Boeing 767 airliners. These airliners contain sealed laser gyroscopes that are parts of the airliners' inertial navigation systems. (CAAC's contract with Boeing requires that the laser gyros remain in their sealed containers. Should they require repair or maintenance, they are to be shipped to Seattle intact.) In principle, better gyroscopes might help China to improve the accuracy of its ICBMs. This is because the Boeing systems are probably considerably better than the corresponding components now installed in the guidance systems of Chinese strategic missiles.

Laser gyroscopes use the properties of coherent beams of light, traveling in opposite directions in a precisely constructed triangular laser cavity, to measure changes in direction of motion in space. Laser gyroscopes can measure these changes more precisely (to within about 2 second of arc), and with higher reliability, than is generally possible with conventional mechanical gyroscopes. Laser gyroscopes require very little maintenance compared to mechanical gyroscopes.

Laser or mechanical gyroscopes are key components of systems that use high-precision measurements of the motion of an object in space to guide that object to a desired final location. These systems, called inertial guidance systems, help guide airplanes and submerged submarines to their destinations and the warheads of intercontinental ballistic missiles (ICBMs) to their targets. Gyroscope accuracy and reliability can be limiting factors in the design of inertial guidance systems, and in the performance of the larger systems of which the guidance systems are components.

The strategic force into which the laser gyroscopes could be incorporated includes six Dong-Feng 5 (DF-5) missiles, which have a range of close to 13,000 kilometers and carry a warhead with explosive power equivalent to 5-10 megatons of TNT, and four DF-4 missiles, which have a range of about 7000 kilometers. (The force also includes over 100 nuclear missiles of less than intercontinental range.)[38] The ICBMs are not thought to be very accurate by US or Soviet standards, with probable errors of several kilometers at their targets (versus less than half a kilometer for modern US or Soviet ICBMs).[39] The small size of China's ICBM force dictates a counter-value, or counter-city, strategy for the immediate future.[40] Although the accuracy of China's missiles is relatively poor, they are quite capable of threatening the destruction of US or Soviet cities. Improvements in missile accuracy or design are unlikely to make a significant difference in China's strategic posture unless the number of intercontinental missiles increases substantially, thereby permitting a counter-force strategy.

Should the Chinese desire to divert the laser gyroscopes in their 767s for use in ICBM guidance systems, regardless of the minimal difference that this would make to the strategic picture, the obstacles they would face would be formidable. First, it is unlikely that a gyroscope built for a civilian aircraft could survive the shock of a missile launch. Even if the gyroscopes were unexpectedly rugged (or could be protected against launch shock) other components of the inertial guidance system, including computers, would have to be upgraded to take advantage of the improved sensor. The Chinese would probably find this difficult. Other factors that affect missile accuracy, including precise knowledge of target location, the effects of anomalies in the earth's gravitational field along the flight path, and the somewhat random effects of reentry drag, are also likely to prove challenging.

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[38] The Military Balance 1985-1986, International Institute of Strategic Studies, London, 1985, p. 113

[39] A. James Gregor, "Western Security and the Military Potential of the PRC," Parameters, Vol. XIV, No. 1, 1984, pp. 35-48

[40] Gerald Segal, "Nuclear Forces," in Segal and Tow, eds., Chinese Defense Policy, pp. 107-108

The Chinese would probably find it even more difficult to duplicate their US laser gyroscopes. The components must be manufactured and assembled under extraordinary conditions of cleanliness. The triangular laser cavity has to be machined extremely precisely, from ultra-stable glass that is quite difficult to prepare. The mirrors at each corner of the triangular laser cavity need to be ground and aligned to unusually close tolerances. Delicate mechanical arrangements are required to maintain the proper interaction of the counter-propagating laser beams.

The connection between Chinese acquisition of a few highly capable US laser gyroscopes, without the knowledge or equipment needed to reproduce or modify them, is much more loosely and uncertainly connected to improved Chinese military capability than transfer of a single US supercomputer.

Supercomputers. Supercomputers are general-purpose computers that can perform many more operations (generally high-precision arithmetic operations) on many more data, much more quickly, than run-of-the-mill mainframe (large, general-purpose) computers. Quantitative definitions of which computers should be considered supercomputers change as the state of the art advances.

Scientists and engineers generally use supercomputers to manipulate numerical data that represent physical quantities, "floating-point" numbers. The number of arithmetic results involving this kind of number a computer can calculate in a second is a useful measure of the speed of such a machine. Supercomputers can carry out millions of operations involving floating point numbers per second and their speed is measured in megaFLOPS (millions of floating-point operations per second). While it must be available for use in a set of calculations, each floating point number in a supercomputer generally occupies eight or more bytes (characters) of space in the computer's high-speed memory. Supercomputers have many megabytes (millions of bytes) of high-speed memory.

The table that follows indicates the speed and memory size of some current examples of US supercomputers.

	PEAK SPEED (megaFLOPS)	MEMORY SIZE (megabytes)
Cray X-MP/12 (Cray Research)	600	32
Cyber-205 (Control Data Corp.)	400	64
Cray 1 (Cray Research)	180	32

Only the US and Japan have produced supercomputers in multiple copies and only the US has produced substantial numbers of these computers for sale.

In December of 1983, Chinese developers associated with their University of Science and Technology in Changsha announced that they had completed (two years ahead of schedule) a computer of indigenous design called the "Galaxy." Subsequently there have been reports of a second Galaxy. The developers claimed that the machine was capable of performing 100 million operations per second. [41] (Because the nature of the operations was not specified, it is difficult to assess precisely the significance of this number.) It is very likely that Chinese scientists who have visited the US for training played important roles in the Galaxy program.

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[41] Edinger, "Recent Developments;" see also Denis Simon, "China's Evolving Computer Industry: The Role of Foreign Technology Transfers," Unpublished paper, May 5, 1986

Fang Yi, chairman of the State Science and Technology Commission and of the Large Scale Integration Leading Group, said that the Galaxy would be used for oil and gas exploration, long-term weather forecasting, satellite image processing, large-scale scientific calculations, and defense programs. A US list of areas in which supercomputers can make their most important contributions would include all of these applications.

However the Galaxy compares with US models, the Chinese continue to express active interest in purchase of US supercomputers. This may reflect the relative capabilities of the Galaxy and the US machines or it may reflect difficulties the Chinese have encountered in duplicating the initial Galaxy. So far, US export controls have inhibited any serious negotiations concerning supercomputer purchases.

The ability of supercomputers to carry out very large numbers of high-precision calculations in very short times allows their users to simulate physical systems with a fidelity that is otherwise impractical or impossible. In development programs where trial-and-error experiments are very costly or very time consuming, high-fidelity supercomputer simulations can sometimes substitute for experiments, with great savings in time and money. By allowing many more trials of candidate designs before a final design is selected, this substitution can also lead to better products at the conclusion of the development effort.

Two military development programs in which this use of supercomputers is or is coming to be indispensible in the US are nuclear weapon design and high-performance fighter aircraft design.

Nuclear weapon tests are so expensive, so time-consuming, and so dangerous (physically and politically) that there will probably always be far fewer of them in a development program than the weapon designers would like. High-fidelity simulations can maximize the return on the few experiments that can be conducted by helping the designer to predict the likely relative and absolute performance of candidate designs before building prototypes. Simulations can also help the designer to gain much better insight into the performance of the prototypes from data gathered in tests. Managers of the US nuclear weapon development program believe that this application of supercomputers is highly cost-effective. They back that belief with almost-automatic orders for the latest US supercomputers, and with a very substantial ongoing investment in the technology base upon which the supercomputer calculations draw.

Should the Chinese buy US supercomputers, and wish to apply them to nuclear design calculations, it would very likely cost them considerable time and expense to develop the high-fidelity modeling techniques and obtain the high-precision scientific data they would need to take full advantage of the improvement in their computational capabilities. US weapons designers have spent many years and many billions of dollars to develop the techniques and data they use. These techniques and data (and the corresponding information used by designers of other nations' nuclear weapons) are carefully protected by elaborate security classification systems. To the extent that these systems are effective, the Chinese will have to anticipate a lag of some years (and considerable expense) before imported supercomputers affect significantly their nuclear weapon arsenal.

Application of supercomputers to high-performance aircraft design is just now becoming common in the US, but aircraft designers are very excited by the possible advantages this new tool offers them. This application (and the advances in the science and technology of computational fluid dynamics upon which it is based) are relatively recent. A well-equipped latecomer to the field would not have as much catching up to do as in a more mature field like nuclear weapon design.

US designers with access to sufficiently capable computers can now simulate with useful fidelity the airflow over an entire airframe. Until recently, these simulations were limited to parts of aircraft, such as a single wing. Because the airflows over different parts of an aircraft are strongly coupled, the partial simulations were much less satisfactory.

The wind tunnel experiments for which supercomputer simulations might partially substitute are difficult and time-consuming. Generally, designers use small scale models in these experiments. The models must be very carefully built. Many experimental conditions and measurements have to be adjusted carefully to allow extrapolation of the results to the full-size system. When the aircraft (and therefore the wind tunnel tests) are supersonic, the experiments become even more difficult.

A suitable supercomputer, programmed to perform simulations using computational fluid dynamic models that are described in detail in Western publications, would be a very valuable aid to the designers of a next-generation Chinese fighter plane. Its use could significantly shorten the time needed to build both first and final prototypes and could result in the design of a better aircraft.

A supercomputer could not help the Chinese build reliable multiple copies of their high-performance aircraft design on an assembly line. The production problems that chronically plague the Chinese aircraft industry are likely for some time to present a crippling impediment to translating improved aircraft designs into military advantage.

Supercomputers are very expensive to operate and have a voracious appetite for work. In addition to physical simulations to support weapon system design, a "diverter" seeking to apply this dual-use item to maximum advantage in improving Chinese military capability might thus choose to devote a part of the resource to improved cryptology capabilities. Only supercomputers can provide the massive computational resources required to have any chance of success in breaking the modern encryption schemes now used to protect even commercial information in the West. By reducing the time required for an assault on a cryptologic system by a factor of ten or more, supercomputers can make defeat of these systems much more feasible.

In summary, the acquisition of US supercomputers could help the Chinese quite directly to improve their military capabilities, in selected areas. These improvements would not require that the Chinese acquire the knowledge and equipment necessary to build their own supercomputers, only that they acquire the machines themselves along with training and support to use them. The improvements in military capability resulting from the use of supercomputers would be noticeable, but not dramatic enough to change the strategic balance.

VII. CONCLUSIONS

Despite a limited body of evidence, some of which is internally inconsistent, this report has identified a number of themes which could help guide decisions about technology sales to China. First, the Chinese are increasing the level of sophistication of the technology they are buying from abroad. Although they state their preference for US technology, they are acquiring technology from a number of supplier countries. There is no way to be sure that equipment denied China by the US for security reasons will not be provided by other suppliers.

Second, it is virtually impossible for a foreign supplier to know whether a particular piece of hardware or body of knowledge will be used for purely civilian purposes or diverted to military applications. The possibility of mistaken identity or diversion always exists, and is probably greater if the end user is within one of the six weapons-producing ministries.

Third, capabilities within China's defense factories vary widely, from rifle production (low end) to the ICBM program (high end). Generalizations are difficult. At the same time, it is safe to say that the acquisition of one piece of equipment is unlikely to make the critical difference for a given military factory. Most Chinese factories will have trouble completing the numerous and complicated steps between acquiring sophisticated components and producing sophisticated weapons systems.

Fourth, therefore, sales of military equipment for "quick fixes" are more likely to have an immediate effect on the quality of China's weapons than dual-use transfers. The effects of these military equipment transfers are likely to be marginal rather than revolutionary.

Fifth, in the near term China does not appear to have an intention or desire to concentrate resources on hardware for an offensive military capability that would threaten the US or its interests in Asia. Nor does it appear that significant changes in military capability have resulted from imports of either dual-use or military technology.

Sixth, over the long term, China is committed to the development of a civilian industrial capability that will support the production of weapons systems comparable to those of the super-powers. The level and quantity of technology China can acquire will clearly have an effect on how quickly they are able to realize that goal. Thus it is in the US interest to assign a higher priority than it has in the past to the analysis of evolving Chinese capability in key dual-use and military industries. This will indicate to us when the Chinese are about to make the transition from needing "everything" to just needing one or two items that really will make a difference. It will also protect us from technological surprises that now seem unlikely but are not, in the long term, impossible.

APPENDIX A

APPENDIX A

TABLE 1 : VALUE (IN US$) OF US EXPORT LICENSES GRANTED FOR SHIPMENTS TO CHINA

	FY 1981	FY 1982	FY 1983	FY 1984	CY 1985
ABSORBERS, ELECTRO-MAGNETIC WAVE				2,813	
ACOUSTIC/ULTRASONIC WAVE SYSTEM	300,400	2,333,599			
CABLE & CABLE MANUFACTURING EQUIPMENT			2,215,002	6,500	524,056
CAPACITORS				46,064,253	31,026
CATHODE RAY TUBES					3,420
COMMUNICATIONS COUNTERMEASURES				336,120	266,556
COMMUNICATION/NAVIGATION EQUIPMENT	4,232,558	4,362,070	8,239,051	23,475,901	23,370,794
COMMUNICATION SWITCHING EQUIPMENT					14,294,277
COMPASSES/GYROSCOPES/ ACCELEOMETERS	131,000	1,044,658	5,021,262	9,738,564	4,901,801
COMPUTER SOFTWARE (BRFORE 1985 UNDER COMPUTERS & EQUIPMENT)*	82,137,473				3,655,171
COMPUTERS & EQUIPMENT		118,064,063	96,057,072	538,081,693	3,884,657,187
CRYPTOGRAPHIC & ANCILLARY EQUIPMENT					359,635

TABLE 1: VALUE (IN US$) OF US EXPORT LICENSES GRANTED FOR SHIPMENTS TO CHINA

	FY 1981	FY 1982	FY 1983	FY 1984	CY 1985
DEEP SUBMERGENCE VEHICLES				66,144	
DOPPLES SONAR NAVIGATION EQUIPMENT				112,999	
ELECTRIC ARC DEVICES	150,000				
ELECTRIC/ELECTRONIC EQUIPMENT	21,778	416,415	270,240		1,013,584
ELECTRON TUBES	39,250	15,531	366,028	378,831	1,263,519
ELECTRONIC DEVICE MANUF. EQUIPMENT	706,293	1,548,960	1,604,861	22,552,431	94,405,863
ELECTRONIC TEST EQUIPMENT (NOW UNDER COMPUTERS & EQUIP)**	30,904,260	34,420,298	54,028,191	57,618,661	24,905,501
ELECTRONIC TUBES					406,579
EQUIPMENT CONTAINING ARRAY TRANS. PROCESSOR (WILL BE UNDER COMPUTERS & EQUIP)**			2,989,642	-3,837,725	14,316,528
EQUIPMENT, ELECTRONIC/PRECISION	33,847			2,942,866	4,943,681
EQUIPMENT FOR MANUFACTURING/TESTING OF PRINTED CIRCUIT BOARDS					5,422,486

TABLE 1: VALUE (IN US$) OF US EXPORT LICENSES GRANTED FOR SHIPMENTS TO CHINA

	FY 1981	FY 1982	FY 1983	FY 1984	CY 1985
EQUIPMENT TO MANUFACTURE/TEST HIGH-TECH MEMORY/SWITCHING DEVICES					7,316,239
FREQUENCY SYNTHESIZERS	4,370	230,532	1,184,262	2,936,182	35,181,746
GAS TURBINE ENGINES		12,000,000	22,000,000	22,214,500	5,600,000
GEAR MAKING FINISHING (GRINDING) MACHINES	634,970	521,435	738,491		
GEOPHYSICAL/MINERAL PROSPECTING INSTRUMENTS				26,306,435	877,283
GRAVITY METERS	414,210	36,290	569,000	779,100	430,000
IMAGE PROCESSING DISPLAY SYSTEMS	1,033,421	1,164,000		2,627,731	1,617,564
INTEGRATED CIRCUITS & ELECTRONIC ASSEMBLIES	831,881	856,955	2,826,030	15,794,397	37,476,077
INVERTERS/CONVERTERS FREQUENCY GENERATORS					25,290
LASER & LASER SYSTEMS	703,708	205,122	1,183,980	2,301,599	6,753,967
MAGNETOMETERS	219,026	134,681	297,553	500,369	1,487,206

TABLE 1 : VALUE (IN US$) OF US EXPORT LICENSES GRANTED FOR SHIPMENTS TO CHINA

	FY 1981	FY 1982	FY 1983	FY 1984	CY 1985
MEASURING/CALIBRATING/TESTING EQUIPMENT, ELECTRONIC		118,500	300,321	15,306,385	32,822,068
MICROWAVE EQUIPMENT	23,825	241,074	234,304	342,533	2,368,468
MONOCRYSTALS	1,102,480		1,088,175	1,163,768	912,416
NUMERICAL CONTROL EQUIPMENT	656,375	2,310,594	3,743,910	8,736,793	13,765,885
NUMERICAL CONTROL EQUIP/COMPONENTS FOR					2,920,474
OPTICAL/OPTICAL TUBE ELEMENTS		4,000			57,809
OSALLOSCOPES &PARTS FOR	352,828	425,332	227,957	1,917,009	3,192,467
PRESSES & SPECIALIZED CONTROLES		292,106	611,596		
QUARTZ CRYSTALS, ASSEMBLIES FOR ELECTRONIC USE	1,903	110	20,917	69,176	11,031
QUARTZ CRYSTAL GROWING EQUIPMENT	848,288				
RADIO RELAX EQUIPMENT					69,224,428
RADIO SPECTRUM ANALYZERS	128,323	156,145	210,759	2,498,134	2,966,071

TABLE 1: VALUE (IN US$) OF US EXPORT LICENSES GRANTED FOR SHIPMENTS TO CHINA

	FY 1981	FY 1982	FY 1983	FY 1984	CY 1985
RADIO RECIEVERS					1,275,000
RADIO TRANSMITTERS				1,778,295	745,203
SEMICONDUCTOR DIODES	25,514	22,026	12	62,412	115,076
TRANSISTORS & DICE-WAFERS	13,669	5,277	21,319	1,117,967	1,357,629
TRANSMISSION EQUIPMENT				11,212,496	3,007,070
UNDERWATER DETECTOR LOCATOR EQUIPMENT	2,216,714	16,850	248,466	17,711,465	2,017,956

* THIS ITEM WAS PREVIOUSLY SUBSUMED UNDER ANOTHER ITEM AND SUBSEQUENTLY BECAME A SEPARATE ITEM.

** THIS ITEM WAS PREVIOUSLY A SEPARATE ITEM AND SUBSEQUENTLY WAS FOLDED INTO OR JOINED WITH ANOTHER ITEM.

*** YEARLY DOLLAR VALUES OF LICENSES MAY NOT REFLECT YEARLY SALES OF THESE ITEMS, BUT SALES MAY HAVE BEEN MADE IN OTHER YEARS OR STRETCHED OUT OVER TIME.

TABLE 2: CHINESE TECHNOLOGY IMPORTS JUNE 1984 THROUGH JUNE 1985

CHINESE IMPORTS 6/1984 THROUGH 6/1985:
COMPUTERS AND ELECTRONICS

FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ MILLIONS)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Eagle Computer Inc.	IBM mini-computers and networking equipment	.80		Mini-computers have a wide variety of military applications
Ono Sokki (Japan)	Fast Fourier transformer systems	1.00	Peking Electronic Tech. Im/Ex and Precision Instrum. Corp.	Used in military command and control, surveillance systems
Control Data Corporation	2 Cyber 825 computers		Nuclear Energy Institute, CAS	Wide variety of applications, esp. training
Automated Systems Ltd. (Hong Kong)	3 DEC VAX 11/750 mini-computers	.50	Zhongshan, Hunan, Guangdong Universities	Powerful minis for many applications
John Fluke Manufacturing, Inc.	Signal generators		CEIEC/Qian Feng Radio Instrument Factory	Generic equipment for search and surveillance
Data General	16/32 bit computer systems	10.0		
Eagle Computers	IBM PC's and PC XT's	4.0		

TABLE 2: CHINESE TECHNOLOGY IMPORTS JUNE 1984 THROUGH JUNE 1985

FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Fujitsu (Japan)	24 large and medium computers	20.5	Various research institutes and universities	
Digital Equipment Corporation	4 VAX 11/780 mini-computers		Various research institutes	
Abigano (Australia)	6 production facilities for printed circuits	40.0	Great Wall Corporation	Components for most modern military electronic systems
Burroughs	Assemble and distribute micro-computers	20.00	Everbright/Yunan Electrical Equipment Factory	
Integrated Business Computers	200 multi-user 16-bit micro-computers			
Winkelmann International (UK)	Telephone tapping and bugging detection equipment	.02	Shanghai Foreign Trade Administration	Obvious military applications
Cit-Alcatel (France)	Technology transfer for a computer center near Shanghai	84.4		
Cambex	40 IBM mainframe computers	10.0		
Radar Devices, Inc.	Collision avoidance systems for fish and cargo ships	15.0		Can be easily used for military ships

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Nippon Electric (Japan)	Set up production line to manufacture 16-bit micro-computers		CEIEC/Baoding Factory, Hebei	
Burroughs	B20 and B25 PC's	20.0	Yunan Electrical Equipment Factory	
Control Data Corporation	Cyber 830 mainframe computer		Shanghai Power Energy Research Institute	
Perkin-Elmer	Super mini-computer for offshore seismic data processing		CNOOC	Could also be used for nuclear blast detection
Matsushita Electronics (Japan)	Integrated circuit production equipment	12.0	Shandong Foreign Trade Corporation	
Dipix (Canada)	Six image processing systems	2.0		Used in search and surveillance applications
Louis Berger Int.	Installation of CAD (computer-aided-design) center			
John Fluke Manufacturing Inc.	Technology and equipment to produce spectral analyzers		CEIEC	Key instruments in radar, Stealth technology, and C3I
Aritsu Electric Co. (Japan)	Technology and equipment to produce signal generators		CEIEC	

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION	REMARKS
Hitec Corp. (Japan)	Porcelain fine-tuning capacitors, technology and equipment		CEIEC/Jinghua Radio Factory	Used in precision tuning devices for C3I and other military applications
Apollo Computer Systems Ltd.	Computer workstations	39.0	Chinese Academy of Sciences	
Matsushita Electric Corp. (Japan)	Signal-processing integrated circuits	4.0	Shandong Foreign Trade Corporation	
Aily-Lityan Microcomputer Corp. (Singapore)	Factory to manufacture micro-computers		Guangzhou Audio and Electric Appliance Factory	Joint venture expected to produce $40 million in computers in the next 5 years
General Robotics	Mini-computer systems production technology	4.0	CEIEC	
Sage Computer Technology	Micro-computer systems	1.5	Baoding Computer Industries Corp.	
Datamedia	Micro-computers		Hebei	
Cullinet Software	IBM-compatible software		MEI/China Computer Technical Service Corp.	
Compac Corp.	Production line for computer terminals (annual capacity of 20,000 terminals)		Beijing Electronic Display Factory	

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Altos Computer Systems	Kits for producing several hundred multi-function mini-computers	3.0	MEI	
Eastern Computers	Technology and software for Chinese character input coding method		China Henan International Economic-Technical Cooperation Corp.	
General Electric Corp.	Production of programmable computers for use in factories		Wuxi Electrical Apparatus Corp.	
Northgate Computer Services (UK)	Joint venture to specialize in fourth generation application techniques		Northgate China Computer Services (Tianjin)	
Wang Corporation	Joint venture to produce personal computers and to assemble and market other Wang products		Xiamen-Wang Computer Corp.	
Televideo Systems Inc.	Build factory to build sub-assemblies for Televideo computers		Beijing No. 3 Computer Factory	

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Marconi Command and Control System Ltd (UK)	Radar beacons and visibility measuring equipment		China Communications Import and Export Corp./Ports of Tianjin, Shanghai, and Guangzhou	
Toshiba (Japan)	Production line and technical data for desk-top copying machines		Wuhan Duplicator Factory	
Societe D'Applications Generales D'Electricite et de Mecanique (France)	Magnetic disc production line		Jiannan Machinery Plant, Hunan	
Hewlett Packard	Joint venture to develop and manufacture electronic products		CEIEC	
Mitsuta Industrial Corp. (Japan)	Production line for electrostatic copiers		Fujian Photoelectric Equipment Factory	
Spire Corp; Electronic Space Systems Corp.	Technology and equipment to make crystalline silicon wafers, photovoltaic cells and modules		CEIEC/MEI	
Lignan Microelectronics Investment Co. (UK)	Joint venture to produce large-scale integrated circuits and micro-computers		Lingnan Microelectronic Industrial Corp., Guangdong	

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION	REMARKS
Indesit Engineering Spa. (Italy)	Turnkey plant for production of passive electronic components		Factory in Beijing	
Fuji Electric Machinery Plant (Japan)	High pressure silicon pile production line		Tianjin No. 3 Semiconductor Equipment Factory	
Skipper Electronics Corp. (Norway)	Joint venture to manufacture navigation instruments		Nanjing-Skipper Electronics Co., Ltd.	
Printronics Pty. (Australia)	Contract to build six printed circuit board factories		Great Wall Industry Corporation	
BASF (W. Germany)	Build a plant for producing 1.8 mm floppy discs		CEIEC/Sehnzhen SEZ	
Semicon Inc.	Assembly fixtures, tooling, marking equipment, mask aligners, for semiconductor manufacturing		CITIC & SITCO/Shanghai #17 Radio Factory	
Sperry Corp.	1100/72 mainframe computers, terminal, software		CAAC	
Harris Corp	1-, 5-, and 10-kw fm radio transmitters	1.5	Everbright/Tianjin Broadcast Equipment Corp	

TABLE 2: CHINESE TECHNOLOGY IMPORTS JUNE 1984 THROUGH JUNE 1985

FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Hitachi Ltd. (Japan)	30,000 personal computers and software development		Research Institute of Railway Science	
General Datacomm Industries Inc.	Low-speed data diagnostic gear	5.0	Unspecified "large Chinese electronics enterprise	
Nippon Electric Corp. (Japan)	Equipment, parts, and technology to produce Chinese language personal computers		CEIEC	
Det-Tronics	Chinese character word processors and touch-sensitive cathode ray tubes screens		Chinese Administration of Computer Industry	
Telebyte Technology Inc.	TDX-75 Magnetic tape systems	0.06		
TELECOMMUNICATIONS				
Philips of Australia	Technology for engineering and manufacturing manual mobile auto telephone systems		Nanjing Radio Factory	
Fujitsu (Japan)	Digital electronic switching system			

TABLE 2: CHINESE TECHNOLOGY IMPORTS JUNE 1984 THROUGH JUNE 1985

FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (In US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Spar Aerospace Ltd.	26 earth stations and electronics for telecommunications	16.0	INSTRIMPEX	
LM Ericsson Telephone Co. (Sweden)	Cellular mobile system and digital land-line telephone network	3.5	TECHIMPORT/Qinghuangdao	
Nagano Japan Radio Corporation	Joint venture to produce marine communication equipment	1.0	Nanchang/Nagano Radio Corporation	
Elk Telecommunications Inc.	Import and produce fiber optic equipment	5.5	Changsha Computer Corp., Hunan	
DCM International	Quality control equipment		Chengdu Telephone Factory	
International Development Corporation, US Government	US financing for feasibility study for technical upgrading of 3 fiber-optic equipment production lines		Ministry of Post and Telecomm./Plants in Wuhan, Shaanxi, and Meishan	
International Business Consulting (Japan)	Consulting to upgrade technology at radio relay plant		Acheng Relay Plant, Harbin	
International Telephone and Telegraph	Digital multiplexers and related equipment	1.4	China National Aero-Technology Import and Export Corporation/Guangdong	

TABLE 2: CHINESE TECHNOLOGY IMPORTS JUNE 1984 THROUGH JUNE 1985

FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
International Standard Electric Corp.	Licensing of multiplexing equipment		Guangdong Posts and Telecommunications Appliance Corp.	
Systems and Applied Sciences Corp.	Landsat ground station, including processing and analysis facility and a film processing facility	10.0	Chinese Academy of Sciences/Space and Technology Center	DEC will provide processing center; Kodak will provide film processing plant
Nippon Telegraph and Telephone (Japan)	Used Japanese crossbar telephone switching systems		Shenyang Crossbar Switching System Plant	NTT will also build an experimental crossbar system to check circuits
Philips Corp. (Netherlands)	Technology for mobile automatic telephones	5.0	Nanjing Radio Factory	Coproduction agreement; Philips will supply knockdown kits for assembly by Chinese
Philips Electronics (Sweden)	Micro-computer controlled teleprinters		Shanghai Communications Equipment Plant	
Comsat General Corp.	Consulting on direct broadcast satellite equipment		Ministry of Radio and Television/China Broadcasting Satellite Corporation	Assistance in obtaining satellite and ground control network equipment
Japan Radio Corp.	Production technology for ultra-high-frequency two-way radios	.85	CITIC/Fushun Radio Factory, Liaoning	

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (in US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
Telefonbau & Normalzeit (W. Germany)	Telephone production equipment		Shanghai Telecommunications Works	
Photon Kinetics	Testing system used in manufacture and engineering characterization of fiber optic cables	.20	Tianjin Economic Development Corporation	
Nixdorf (W. Germany)	Digital telephone switching equipment	.50	Jinan Radio Factory, Shenzhen Electrical Appliance Corporation	
Alcatel-Thomson SA (France)	3 E-10 digital telephone switching systems	6.8	Dongguan	
Cable & Wireless PLC (Great Britain)	Feasibility studies for production of fiber optics, microwave, and other long distance equipment			
CIT-Alcatel (France)	Telephone switching units, optical fiber transmission gear and connecting units	100.0		
Pacific Telesis	Study to assist in updating telephone system		Yunnan Provincial Import & Export Corp.	

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FOREIGN SUPPLIER	ITEM	DOLLAR VALUE OF TRANSACTION (In US$ Million)	CHINESE PURCHASING ORGANIZATION/END USER	REMARKS
STC Telecommunications Ltd. (UK)	Telephone cable, pulse code modulation cable, training for telecommunications equipment servicing	1.8	Guangdong Municipality	
Gould Inc.	Digital storage oscilloscopes and wave form processors		CEIEC	

Sources: This table was compiled from press clippings and from tables in the China Business Review. The table covers only transactions that were reported between June 1984 and June 1985. Very little information exists about whether or not the contracts resulted in actual deliveries.

CEIEC = China Electronics Import/Export Corporation
CITIC = China International Trust and Investment Corporation
CNEIEC = China Nuclear Energy Industry Corporation
MEI = Ministry of Electronics Industry
CNOOC = China National Offshore Oil Corporation
CAAC = Civil Aviation Administration of China

TABLE 4:
CHINESE ACQUISITION OF FOREIGN MILITARY HARDWARE: 1975-1986

(The date for a transaction may refer to the press report rather than the sale itself.)

DATE	SUPPLIER	ITEM	MILITARY SYSTEM
1975	Rolls-Royce	Spey Jet Engines (Licence agreement)	
1980	France	SM-358 DSRV unit	"Kansha" class salvage ship-supporting SLBM test
1984	France	HOT missiles (small numbers reported to have been observed)	
1985	Egypt	MiG-23 (exchange for spares and complete aircraft of earlier models)	
1985	Israel	105mm rifled main gun	Type-69 and 59 main battle tanks
1985	OKI, Japan	OKI N-XE12 slotted wave-guide navigational search radar	Hydrofoil ships and Gordyy "Anshan" class destroyers
1985	Creusot-Loire, France	Creusot-Loire 100mm compact dual-purpose gun mount system	New missile destroyer (under development)

TABLE 4: CHINESE ACQUISITION OF FOREIGN MILITARY HARDWARE: 1975-1986

DATE	SUPPLIER	ITEM	MILITARY SYSTEM
1986	US Department of Defense (FMS)	Large Caliber Artilery Modernization Program: Fuses, primers and detonators ($28 million); Technical data and advisory package offered. (Coproduction agreement signed)	155mm artilery
1986		Anti-Submarine Warfare (ASW) Avionics Package:	SA-321J Super Frelon heavy helicopter
	Thompson-CSF, France	Thompson-CSF HS-12 sonar;	"
	Lamporo	Lamporo data processing unit;	"
	Omera	Omera ORB-32 search radar;	"
	Crouset Nadir	Crouset Nadir navigation system;	"
	SFIM	SFIM auto-pilot system	"

Sources: Aviation Week & Space Technology, 6 Oct. 1980, p. 25; 3 Feb. 1986, pp. 31-32; China Business Review, July-August 1984, p. 37;The Economist, 25 Jan. 1986, p. 31; Interview with Mr. Leonard Hillebrandt, East Asia Office, DOD, OSD, Defense Security Assistance Agency, 32 June 1986; International Defense Review, Dec. 1985, p. 1923; Jane's Defence Weekly, 12 Jan. 1985, p. 51; 23 Feb. 1985, p.322; 16 Mar. 1985, pp. 457, 432; 13 Apr. 1985, p. 620; 27 July 1985, pp. 160, 171, 174; 5 Oct. 1985, p. 717; 26 Oct. 1985, p. 911; 21 Dec. 1985, pp. 1367, 1369; 11 Jan. 1986, p. 5; 25 Jan. 1986, p. 114; 22 Feb. 1986, p. 311; 8 Mar. 1986, p. 436.

POLITICS, POLICY, AND CHINA'S FUTURE COURSE

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INTRODUCTION

When Mao Zedong died in September 1976, China had both an opportunity and the necessity to address serious economic, social, and political problems caused by shortsighted, misguided, and ineffectual policies. Pressures for reform had been building for years, but they were held in check by the reluctance of most leaders to modify significantly the institutions and procedures established in the 1950s, and by Mao's unrivaled authority and commitment to the radical alternatives of the Cultural Revolution. By the time of his death, the situation had become so bad that there was little support for the status quo. When change finally came, it came with remarkable speed and has probably gone further than anyone had anticipated. Despite their speed and magnitude, however, changes have proceeded smoothly and with an aura of stability and continuity. Indeed, Chinese leaders point to stability as a if not the major achievement of the post-Mao era.

How are we to explain declarations of stability in the midst of obvious and extensive change? Are Chinese leaders engaged in wishful thinking or deliberate deception, or has the very process of change engendered greater stability and predictability? More to the point, will the opening to the outside world and fundamental domestic reforms endure, or will they prove as fragile and transitory as earlier efforts to transform China? If the outcome is still uncertain, what developments inside and outside of China will determine whether the reforms continue to evolve in the same direction or will be abandoned or reversed? The analysis presented below indicates that prospects for stability and continuity, and for the reforms to achieve their intended objectives, are both good and improving. The four factors that appear to be most important are:

1. Whatever their other differences, all political leaders attach high priority to the maintenance of economic, social, and political stability.

2. The skill with which personnel and policy changes have been made has minimized and isolated opposition, and given most players a greater stake in the reforms than in any available alternative course.

3. The reforms have brought tangible benefits to the nation as a whole, to a wide range of constituencies and interest groups, and to individual citizens. These achievents enhance the legitimacy of the reforms and the regime that has put them into effect.

4. Over time, a growing number of senior and second-echelon leaders seems to have accepted the idea of a "worldwide technological revolution" with a dynamic and requisites of its own. To participate in and take advantage of this revolution--and to avoid falling dangerously far behind--China must abandon the structures and policies of the past and is constrained in the choice of options for the future.

Each of these factors will be examined in the analysis that follows, but before turning to that analysis, it will be useful to present a broad overview of the post-Mao period and macro-level developments shaping China's approach to the acquisition and assimilation of new technologies. Rather than identify differences in approach or emphasis in individual policy areas or from one region of the country to another, this summary will describe overall trends. It will also introduce and define descriptive terms used later in the paper.

OVERVIEW: 1976-1986

For the purposes of this paper, the post-Mao era can be divided into three periods. The first period or phase of policy evolution began immediately after the Chairman's demise and lasted until late 1978. This phase was characterized by tension between defenders--and beneficiaries--of structural and policy changes introduced during the Cultural Revolution, and former victims determined to restore much of the system extant in early 1966. Despite significant policy differences and personal animosity between those who had gained power during the Cultural Revolution and the "veteran cadres" they had replaced, there was a shared commitment to restore order, revitalize the economy, and regain the confidence of the people. Restoring legitimacy and the capacity of the system to meet the challenges of modernization took priority over settling old scores.

Although the removal of the "gang of four" and their most prominant supporters eliminated those most determined to maintain the practices and organizational forms adopted during the "ten years of chaos," a number of senior leaders and most of those holding official positions were reluctant to jeopardize their careers or discard all of the so-called "socialist new-born things." They recognized the need for change to raise efficiency and restore legitimacy, but they also wanted to preserve as much as possible of the existing system. This group, later called the "whateverists" by their opponents because of their opposition to changes that violated anything that Mao had said or done, is referred to as preservationists in this paper. The leader and in many ways the symbol of the preservationists was Hua Guofeng.

Opposing but cooperating with the preservationists was a loose alliance of rehabilitated cadres and senior officials who had been eclipsed but not removed entirely during the Cultural Revolution. For ideological and personal reasons, or because they perceived China's problems differently than did the preservationists, this group wanted to discard many of the changes introduced after 1966. Some, here called the restorationists, wanted to reestablish the economic and administrative system extant in the early 1960s because they believed that only comprehensive central planning and control could enable China to meet the social and economic challenges confronting the nation. Others in this category were less wedded to the structures and approaches of the past but regarded restoration of the 1966 system as a necessary step toward development of a more effective approach to modernization. In other words, they regarded restoration as a useful step toward eventual transformation. In the pages that follow, this group is called the transformationists. During the 1976-78 period, differences between the restorationists and the transformationists were minor or muted and much of the time they acted as a single group or coalition. Chen Yun, Nie Rongzhen, and, after his rehabilitation, Deng Xiaoping, were prominent members of this coalition.

The 1976-78 period was characterized by determined efforts to restore the credibility and capability of the Party and the successor regime. Policies and pronouncements emphasized the restoration of stability and predictability, termination of the most noxious of the Cultural Revolution innovations, and measures to win time and support from skeptical cadres and citizens. To forge as large a coalition of supporters as possible--and to avoid alienating any more than absolutely necessary, Party leaders promised something for everyone and avoided decisions that would invite opposition. Only a small number of people were to be excluded from their grand coalition, namely, those who were closely identified with Viang Qing and her principal allies. The key to national strength and prosperity, it was argued during this period, was removal of the "gang of four." With their removal, and the abolition of the most irrational practices of the Cultural Revolution, China could realize its full potential. Having "unfettered" the nation's workers, peasants, soldiers, and intellectuals, China could quickly improve economic performance and raise living standards. The key to achieving this goal, it was said, was to modernize science and technology. New technologies were to be developed indigenously or imported from abroad. Since China needed "everything," acquisition could be relatively unplanned. Moreover, assimilation of new technologies was assumed to be relatively easy. The difficulties inherent in such an approach were doubtless recognized by some in the leadership, but, for political reasons, it was deemed essential to minimize their importance.

Phase two began with the Third Plenum of the Eleventh Central Committee of the Chinese Communist Party in December 1978 and lasted until early 1982 when long-discussed administrative and personnel changes were actually put into effect. During this period, the coalition of restorationists and transformationists scored a decisive victory over the preservationists and began to discard not only most of the "socialist new-born things" of the Cultural Revolution, but also many of the structural forms adopted during the Great Leap Forward (1958-60). Under the banner of "practice is the sole criterion of truth," the coalition of restorationists and transformationists criticized virtually every "Maoist" innovation. Although the formal assessment concluded that Mao had been seventy percent correct and only 30 percent wrong, his "errors" included such hallmarks of New China as communes, egalitarianism, and reliance on people's war.

As one might expect from a coalition comprised of groups with different visions of the future, the policies adopted during this period evince both compromise and discontinuity. Thus, for example, greater decentralization in certain policy areas (e.g., rural organization and agricultural policies more generally) was accompanied by tighter central planning and control in others (the energy sector and foreign trade, for example). This was also a period of experimentation in which those who wanted to update the system of the First Five-Year Plan to meet the changed circumstances of the 1980s, and those searching for a new Chinese form of socialism could test their ideas and determine the limits and advantages of each approach. Thus, the restorationists seem to have had a relatively free hand in "readjusting" the urban economy and the transformationists appear to have enjoyed similar latitude in the countryside. This is obviously an oversimplification of a very complex process, but, as in the earlier phase, those with different views and policy preferences appear to have worked out a modus vivendi designed to maintain stability and identify the most effective solutions to China's formidable problems.

Protagonists on both sides wanted to avoid the kind of "unprincipled struggle" and ad hominum attacks that had characterized the Cultural Revolution. There were many reasons for wanting to do so. One was to disabuse the people of the notion that Party leadership meant little more than a struggle for power and position in which the interests of the nation were secondary. Another was that most leaders were probably uncertain what course of action would best meet China's needs. Undue self-confidence had gotten the Party and the country into difficulty twice in the recent past; prudence was clearly warranted because the consequences of another major policy error could be disasterous. Cautious experimentation, willingness to admit mistakes and make necessary modifications, and a stronger commitment to results than methods characterized this period.

Policies governing the acquisition and assimilation of technology during this period differed from those of the preceding one in three respects. First of all, trade officials and enterprises authorized to purchase equipment and technology from abroad were encouraged to obtain know-how as well as products. Whereas 1976-78 guidelines had permitted and even encouraged the acquisition of equipment embodying advanced technologies, those issued in the second phase of reform emphasized that it was "better to import hens than to buy eggs." A second change from the earlier period was that policies paid more attention to the assimilation and application of imported equipment and technology.

China's leaders had learned the limitations of "out of the box" purchases and began to authorize more expensive but ultimately more valuable cost plus contracts that included installation and training programs. Similarly, they learned that reverse engineering can be as difficult and time consuming as invention and that China would have to enter into joint ventures, licensed production, and other active modes of technology transfer if the country was to realize its developmental goals fast enough to fulfill government promises and to satisfy rising expectations. The third difference between the technology transfer policies of phases one and two is that the central government reasserted control over imports of technology and equipment. This was done to reduce the expenditure of foreign exchange for equipment no better than that obtainable from domestic suppliers, to reduce duplication and acquisition of systems utilizing incompatible technologies, and to ensure that the equipment and technologies that were imported could be assimilated and used to full advantage. As will be shown below, these policies were sound in theory but proved difficult to apply in practice.

The division between phases two and three is less clear-cut than that between the first and second phases because the rate and magnitude of change increased significantly after 1978. Indeed, Chinese commentators divide the post-Mao era into just two periods: before and after the Third Plenum. There is a certain utility to their periodization, but it masks important developments that have shaped and will continue to shape the course of reform and the strategy of technology transfer.

The administrative and personnel changes that began in early 1982 and continue today have had three primary objectives: removal of superfluous, superannuated, underqualified, and politically unreliable cadres; simplification of administrative organizations and procedures to improve efficiency and overall system performance; and preparation for additional reforms needed to "meet the challenge of the new technological revolution (NTR)." In the course of removing and replacing Party and state cadres at all levels of the system, transformationists managed to remove not only the preservationists who had been retained through the first two phases, but also many rehabilitated veteran cadres who tended to side with the restorationists. At the same time, as part of the drive to make cadres younger, better educated, more technically competent, and more revolutionary, the transformationists added a new generation of technocrats (such as Li Peng and Song Jian) who better understand the requirements of the NTR.

Depicting developments of the past four years as the partial triumph of the transformationists over the restorationists is warranted, but it oversimplifies what actually happened. For one thing, it obscures the fact that both restorationists and transformationists learned valuable lessons from the experiments conducted in the preceding phase and that members of both groups seem to have concluded that it was no longer possible or desirable to merely tinker with the system China had adopted during the period of Soviet tutelage. Restorationists who disagreed with this conclusion have been--or soon will be--excluded from the policymaking process. The second way in which it oversimplifies the situation is to mask or mischaracterize the new cleavage that has emerged as leaders have assessed and addressed the results of prior reforms. The new and now principal cleavage or issue concerns the pace, not the direction, of reform.

Most foreign analysts have characterized the latest split in the leadership as a struggle between conservatives (manifesting most of the traits this paper ascribes to the restorationists) and reformers (similiar to those I have called transformationists). This is misleading because, in my view, virtually all those who now occupy leading positions in China consider themselves, and deserve to be called, reformers. The difference is that some are more cautious than others, or, stated differently, that some favor a step-by-step apporoach while others think it essential to take many steps simultaneously or in rapid succession. At the risk of further terminological confusion, I have described these two loose groupings as moderates and reform-mongers.

Moderates and reform-mongers differ in their approach to many aspects of reform. For example, whereas moderates want to solve one problem before tackling another, reform-mongers maintain that most problems are linked and must therefore be addressed at the same time. Moderates want to solve problems completely; reform-mongers are content to alleviate them and go on to other matters. Unanticipated and unwanted side effects are very disturbing to the moderate, but the reform-monger accepts them as additional problems to be tackled in due course. The list of differences could easily be extended, but doing so would exaggerate their magnitude and significance. To be sure, the differences are both real and important, but they are less important than is the shared commitment to effective reform of China's economic, social, and political institutions.

One could point to many examples to demonstrate that present policies reflect restorationist as well as transformationist approaches to modernization, but this overview will cite only a few. Perhaps the clearest illustration is the mixed approach to planning and market mechanisms, and to centralization and decentralization that characterizes the current strategy of development. Despite broad and substantial devolution of authority and responsibility to lower levels of the political system and to individual enterprises, factory directors, and households, the center has retained control over those activities and sectors of the economy considered most important for the attainment of national objectives. Thus, for example, the center and central planning still play a dominant role in the energy, transportation, and telecommunications sectors; in the development of critical technologies such as microelectronics, computers, bioengineering, telecommunications, energy, and advanced materials. Most other sectors and technical fields are now monitored or administered by lower-level units. The center exercises little or no control over, and does not attempt to plan for, a growing number of economic units. These units, which range from specialized households in the countryside to medium-sized factories and mines, have considerable authority to manage their affairs and respond to market signals. Another and very different example of this mixed approach concerns the mobility of technical specialists. Although general policies enable technical specialists to change jobs, persons working on key national projects (i.e., those of greatest concern to and controlled by the central government) are prohibited from doing so.

Despite their differences, the reformers have initiated a number of changes that go beyond what was possible before 1982. Examples include the introduction of taxes on enterprise profits, limited but nevertheless significant price reform, and fundamental reform of the management and funding of scientific research. Implementing these and other recent reforms has proven to be more difficult and the results less clear-cut than was the case in the previous two periods, but pressure to abandon the effortappears minimal. Critics want the reforms to work better or faster, they do not want to roll back the clock.

As in the overviews of the two previous phases, this section will conclude with a brief look at policies governing the acquisition and assimilation of technologies. Here, too, recent measures evince features of both the restorationist and the transformationist approach. On the one hand, the central government is attempting to exercise greater control over the expenditure of foreign exchange in general and for technology acquisition in particular. The objectives are similar to those of earlier periods, namely, to avoid duplication, ensure compatability and ease of assimilation, and to target acquisition of critical technologies. On the other hand, individual units in China now enjoy considerably greater latitude, and have more resources, to acquire equipment and technology from Chinese sources through the new "technology market." Moreover, they can contract with research institutes or other enterprises to develop specialized equipment or techniques.

Another change from the previous period is that policies now call for the acquisition of appropriate rather than advanced technologies. Rather than always seeking state-of-the-art equipment and know-how, trade officials and plant managers are encouraged to seek technologies appropriate to China's present conditions. In some fields, such as telecommunications, China still seeks the best available, but in others (e.g.,the petrochemical industry), responsible officials are permitted and encouraged to procure less advanced, lower cost, but still useful equipment and know-how. This approach enables China to acquire more technologies and to assimilate them more easily than was possible under the approach of the previous phase.

Before concluding this introductory section, it will be useful to add one additional definitional note concerning use of the terms technology and technology transfer. When juxtaposed to words such as equipment or products, technology refers to the know-how required to manufacture a particular product or achieve specified parameters. This, of course, is the normal meaning of the word. At other times, however, technology is used is the less precise and more inclusive way common in Chinese discussions of science and technology or the new technological revolution. The principal difference is that Chinese usage often combines or equates product and know-how. It is not surprising, therefore, that many enterprises and foreign trade officials responded to calls to acquire new technology by procuring products rather than know-how.

Technology transfer refers to the assimilation as well as the acquisition of a new technology. Unless and until the recipient has mastered use of the technology, its transfer is incomplete. It has taken Chinese officials some time to appreciate the difficulties and requirements of technology transfer, but they now attach equal importance to acquisition and assimilation. With this as background, we will begin the more detailed analysis of the interplay of politics and policy, and their implications for technology transfer to China.

POLITICS, PERSONNEL, AND POLICIES

The developments outlined above were the product of many interactive factors including luck, shared commitment to restore stability and Party legitimacy, determination to modernize China as rapidly as possible, and growing confidence derived from the success of early reforms. From the first days of the post-Mao era, political leaders, including Hua Guofeng and others later criticized for slavish devotion to the late Chairman's words and deeds, understood and emphasized the need to restore stability and to improve the credibility and capability of the Party-led state apparatus. Both the Party and the state had been greviously weakened by the Cultural Revolution. China had stagnated and looked decreasingly capable of providing adequately for its exploding population. To make matters worse, on almost every dimension (e.g., economic strength, military might, scientific and technical capabilities), the PRC had fallen increasingly far behind not only the superpowers but also a growing number of developing countries. This was an affront to China's national dignity, but, more importantly, it endangered China's sovereignty and independence. The first priority was to restore order, stability and confidence; the second was to get the country moving again.

As part of the effort to restore stability and the confidence of cadres and ordinary citizens, Mao's immediate successors appear to have made a conscious decision to defer resolution of many "questions left over from history," and avoid even the appearance of retribution against those who had benefitted from the excesses of the Cultural Revolution. Personal rivalries and the settling of old scores had to be delayed or set aside entirely if the Party and state were to regain lost legitimacy and the capability to meet the challenge of modernization. These twin goals were entirely compatible: power struggles and personal rivalries would have further debased the Party's already shakey authority; cooperation brought together skills and information needed to revitalize the economy and restore military strength.

During the first phase of the post-Mao era, senior leaders sought to win as much support as possible for the regime and its efforts to revitalize the nation. By restricting the target of criticism to the tiny group most closely associated with the "gang of four" and to practices that were distasteful to most citizens, and by promising specific benefits to virtually every interest or constituency in the nation, Hua and his associates managed to forge a loose but effective coalition. In certain resepects, this coalition resembled that established in the early 1950s when all but a handful of "counter-revolutionaries" were united to build a "New China." The analogy should not be pushed too far, but it is appropriate in so far as the the successor regime used patriotism and the promise of stability and better living conditions to enlist the support of those whose skills were essential to the attainment of developmental goals. Appeals for support resurrected in the late-70s and reiterated to the present affirm the importance of national self-strengthening through modernization, and affirm that the purpose of modernization--and the goal and purpose of Party leadership--is to raise the material and cultural level of the Chinese people.

To raise the capacity of the state to meet the challenges of the "four modernizations" (agriculture, industry, national defense, and science and technology), it was necessary to restore and expand bureaucratic agencies at all levels of the system. During the Cultural Revolution, the scope of governmental responsibilities was drastically reduced as, under the banner of local self-reliance, responsibilities and revenues devolved from the center to provinces, cities, communes, and individual enterprises. The resultant system worked, but it was extremely inefficient. Growth kept pace with population increases, but living standards remained stuck at a level only slightly higher than mere subsistance. The coalition of preservationists, restorationists, and transformationists was determined to restore the capacity to plan, monitor, and administer the economy, schools, S&T activities, and all other sectors and facets of everyday life.

As part of this rebuilding effort, they created many new positions and adopted a strategy that greatly expanded the size of the bureaucracy. This was done for both practical and political reasons. Since the bureaucracy was expanding, there was no immediate need to remove persons who had become officials during the decade of turmoil. This group was later scathingly criticized on grounds of incompetence and political unreliability, but during phase one the leadership needed the Cultural Revolution appointees. Whatever their faults, these people had been running the system for nearly a decade and knew better than anyone how to make things happen. The new regime needed these people because it needed their knowledge and contacts, but they were kept on for another reason as well. By retaining them, the Hua Guofeng leadership was able to reduce fears of retaliation and make concrete its pledge of stability.

A second group of people assigned to positions in the restored bureaucratic structure consisted of "veteran cadres" who had been criticized or deposed during the Cutural Revolution. Restoring them to positions of responsibility was, in part, a way of acknowledging that they had been unfairly criticized. This was not mere cronyism or a gesture of exoneration, however, because rehabilitated former officials were presumed to know how to restore and operate the pre-Cultural Revolution system which was being rebuilt. These were, after all, the colleagues and subordinates of Chen Yun, Li Xiannian--and later Deng Xiaoping--who were regaining influence in Hua's transitional administration. Restoring them to official posts was part spoils system and part search for specific areas of competence. It was also an effort to place in key positions persons thaought to hold a particular attitude toward the role of the state.

A third group recruited to fill positions in the expanding bureaucracy consisted of technocrats who had been trained China or abroad during the 1950s and early 1960s. These technocrats had been too young to assume positions of importance prior to the Cultural Revolution, but they were believed to have skills vital to the drive for modernization. The importance of this group was limited in phase one, but it has increased steadily in the years since they entered the bureaucracy.

Expanding the bureaucracy at all levels of the system produced practical and political benefits, but it also entailed substantial costs. On the benefits side of the ledger, it unquestionably improved the capacity of the central government to monitor and manage economic, social, and political developments throughout the country. It also helped to win the support of significant political groups by giving them tangible benefits and a personal stake in the new regime and whatever policies it might adopt.

Bureaucratic expansion had drawbacks as well. One, which became increasingly significant in later years, was the financial cost. Another was the uneasy juxtaposition of veteran cadres and their former Red Guard tormentors. Personal animosities die hard in China; many former Red Guards remained distrustful--and fearful--of those they had displaced, and former victims were uneasy about cooperating with those with whom they had scores to settle. Personal feelings could be put aside for a time in order to move ahead with vital programs, but these scores eventually had to be settled. A third cost was inefficiency. There were, quite simply, too many people, decision points, overlapping jurisdictions and responsibilities, and too much redundancy. This was a textbook prescription for delay and indecision. Eventually, that is, by late 1981, it was clear that something had to be do to alleviate these problems.

The coalition building efforts of phase one were also reflected in the Hua Guofeng-Yu Qiuli program for national development and the various multi-year plans adopted by national conferences on education, science and technology, and many industrial other constituencies. Two characteristics of these plans and programs stand out more than any others: they were all overly ambitious and they all avoided making difficult or meaningful choices. These were not real plans, they were wish lists promising something for everyone. Educators were promised better facilities, more disciplined students, and higher salaries; agriculture would be "basically mechanized" by the mid-80s; scientists would have more time and better equipment for research; factories would obtain new and more advanced equipment; workers would receive higher wages and everyone would have access to more and better consumer goods. It is easy to deride these plans and promises as unrealistic, but to do so misses the point. That they were unattainable was unimportant; their existence and the way they were presented bought time and support for the new regime which enabled it to pull up its socks and put together more realistic policies with real priorities.

Although the "plans" of 1977-78 ultimately proved to have greater political than practical value, the leadership did attempt to put them into effect. Much was learned or relearned in the process. Several lessons are germane to the subject of this paper for they altered both perceptions of and policies toward the acquisition and assimilation of technology. For example, senior leaders learned that it can take a long time and substantial investment to translate research findings into production technologies, and even longer to put the new technologies into effect. Whether because they were largely ignorant about research to production processes, were deliberately or unintentionally misled by scientists drawn into the policymaking process for the first time, regarded the plans as primarily political documents, or for some combination of these reasons, senior political leaders regularly spoke as if China's scientists and engineers would quickly score breakthroughs in basic research and immediately translate their discoveries into beneficial technologies. During phase one, these leaders, factory managers, young engineers, and many others learned that the process is not that simple. This discovery was an important step toward the later (beginning in 1981) emphasis on applied research and closer links between economic and S&T planning.

Another important lesson was that it is often easier to acquire than to assimilate a new technology. Having largely abandoned turnkey acquisitions of the kind that had brought China modern petrochemical plants earlier in the decade, Beijing pursued a strategy that emphasized acquisition of products embodying newer technologies and eschewed installation and training programs. As noted in the overview section, it was during this period that China's decision makers learned the limitations of such an approach and began to develop and implement measures to facilitate absorption and application as well as the acquisition of technologies.

This brings us to yet another lesson of the 1976-78 stage of policy evolution, namely, the importance of distinguishing between equipment and know-how. Although political leaders and policy statements called for procurement of technologies, foreign trade officials and others responsible for acquisition frequently responded by buying products. Indeed, there was very little meaningful technology transfer during this stage even though China did begin to purchase a good deal of equipment. Subsequent policies and procedures have attempted to correct this problem, but the results have been mixed at best.

Despite the premium the leadership placed on personnel, policy, and general political stability, intra-elite differences began to surface quite early in the post-Mao period. Those differences became more apparent after Deng Xiaoping was rehabilitated and resumed an active public role in late 1977. At issue was whether to retain or discard practices and personnel associated with the Cultural Revolution. The struggle between preservationists and restorationists (in alliance with the transformationists) was intense, but it proceeded almost entirely out of public view because all protagonists were eager to preserve the facade of unity. There was simply too much at stake to risk an all out struggle for power. Neither side was willing to retire without a fight, but when the dust settled, both sides were able to live with the results.

Several factors contributed to the triumph of the restorationist-transformationist alliance. One was surely the political skill and will of Deng Xiaoping and his allies who enjoyed a clear edge over the more cautious, less experienced Hua Guofeng. By providing a mix of positive and negative inducements, Deng not only coopted or neutralized many individuals who had once stood with the preservationists, he managed to do so with such skill that few "losers" departed in anger or determined to renew the fight at a later time.

Deng's strategy was to begin by attacking the most vulnerable of the preservationists--a group typified by Chen Yonggui. By making it clear that they could not win and giving them a graceful way to retreat--applying political muscle when needed--Deng managed to remove or neutralize those who might have championed the preservationist cause at the apex of the political system. Shortly after launching his rolling campaign to remove opponents and obstructionists from the top of the system, Deng and his allies began a more difficult and far-reaching assault on actual and potential opponents in grassroots positions. Both parts of this high-low strategy utilized three linked but distinct approaches.

One approach was to remove opponents in the course of a broader drive to simplify and streamline administrative organs by clarifying responsibilities and removing redundant positions and the incumbents who filled them. What might otherwise have been regarded as a vindictive or personalized attack on Cultural Revolution appointees or those associated with particular leaders or factions was explained--and widely accepted--as necessary to increase efficiency. Since the system was unquestionably inefficient and incapable of meeting the challenge of the new technological revolution, there was widespread support for the campaign if not necessarily for the individual targets. At any rate, people were removed, reassigned, retired, or otherwise dismissed without detriment to their reputations. Administrative reform and personnel change continues (additional retirements and personnel changes are anticipated at the forthcoming session of the National People's Congress) and appears to have been accomplished without great difficulty or effective opposition.

A related program was conducted under the banner of Party rectification. Aimed more at lower-level cadres than at senior officials, this program has several goals, including removal of those who had committed serious offenses during the Cultural Revolution and those who oppose reform. The latter category is aimed at obstructionists, incompetents, and those more interested in personal gain than public benefit. Removing such persons from Party and state positions has helped to restore the prestige of the Party. It is noteworthy that persons removed through this and other methods designed to achieve personnel reform were given alternatives that may well have appeared favorable to continued service in the bureaucracy (e.g., contracting to become a specialized household or taking advantage of opportunities created by the reform of commercial policies). Moreover, they were given plenty of advance warning and ample opportunity to step aside gracefully. Many in fact did so.

As noted in the introductory overview, personnel and administrative reform continues and, in phase three, has been directed principally at persons who could reasonably be assumed supportive of the restorationist approach. Not everyone has gone without a struggle. There are reports, for example, that Deng and his lieutenants had to conduct long and difficult negotiations to persuade senior leaders to step down at the September 1985 Party Conference. But they have stepped down and appear uninterested in--and incapable--of storming back onto the scene to thwart the reform process. This is perhaps the most important aspect of the many personnel and policy changes that have occurred since 1976; they have been conducted in such a way as to make it difficult if not impossible for potential opponents to mount a serious counterattack. Many of those who have been removed now have a stake in the reform program. This enables the reformers--both the moderates and the reform-mongers--to proceed with confidence and considerable latitude. They can afford to make mistakes because they have an increasingly significant reservoir of support from the public and know that there is no antagonistic group of "losers" waiting in the wings to pounce upon any and every error or unanticipated development. Individuals can--and do--continue to disagree about the pace, composition, timing, and other dimensions of reform, but the basic idea that reform is necessary and beneficial enjoys wide support.

In addition to removing actual and potential opponents of reform, personnel changes have also brought into the system a large and growing number of new administraters and technical specialists. Three characteristics of this group merit attention here. First of all, those entering official positions in the Party, government, and economy are younger and better educated than the people they have replaced. Youth is not a guarantee of diligence, but remaining and newly appointed functionaries are healthier and more capable of devoting more time and attention to their responsibilities. They are younger, but they are not young or inexperienced. Many have labored for decades in posts just below the top ranks of their current units. Moreover, their better educations presumably make them better able to understand and respond to the "requirements of the new technological revolution." Some of them do, in fact, have technical backgrounds (Vice Premier Li Peng is generally regarded as the senior and therefore model "young" technocrat); even those who do not are presumed to be more sensitive to the needs of science and technology than the cadres they replaced. Rather than betray their own low level of understanding, those without technical training may defer to those with more technical expertise or experience. betray their own low level of understanding. Among other consequences, this has opened the way for more formal and informal consultation of technical specialists and altered the terms of discourse in policy debates. Those who can marshall technical arguments have an advantage over those who cannot.

A second important characteristic of the "new" group of leaders is that they can and must work in an environment very different from that of the past. Responsibilities are clearer, the number of coordination and decision points has been reduced, and the demand for action is greater than it has been for decades. Delay and indecision will no longer be tolerated; it is both possible and necessary to exercise real leadership. In addition, individuals have greater personal incentives to act decisively; cadres who show results will be selected for promotion in a system that promises to be much more fluid and dynamic than in the past. Those who do nothing of consequence can no longer sit back secure in their positions; they might well be reassigned or demoted. Ideological orthodoxy and the ability to quote or interpret the canons of Marxism-Leninism-Mao Zedong Thought are neither required nor very helpful in climbing the ladder of success in Deng's China.

As noted above, the "strategy" of phase one consisted of promising something for everyone with no real priorities. By the latter part of 1978, however, it had become clear to the top leadership, probably including the preservationists, that the ambitious goals and politically motivated promises proclaimed only a short time earlier had to be replaced by attainable targets and meaningful plans and priorities. This realization, together with more careful studies of what was actually needed in different sectors of the economy and what could be attained within specified periods gave rise to a mixed strategy that continues to shape policies in general and technology transfer in particular.

Reduced to its simplest terms, this strategy calls for narrowing the scope of central control by devolving responsibility for many activities to lower levels of the system. Devolution is depicted has having two advantages: the center can more effectively manage those units and activities remaining within its purview; and lower levels of the system can more easily and more fully tap their full potential. The assumption here is that lower-level units will pay closer attention to and provide more effective supervision of matters falling within their jurisdictions than the center could if it still had to deal with "everything." In other words, the approach calls for Beijing to do less to ensure that what it does do is done well. It also requires local units to assume more responsibility and authority for matters no longer controlled by the central government. By reducing the scope of its own activity, the central government has been able to reduce the size and complexity of the bureaucracy, make better use of limited resources, including technical and administrative specialists, and better promote the four modernizations.

Restorationists such as Chen Yun endorsed this change because it promised to make planning and central control more effective; transformationists like Zhao Ziyang also approved the change because it provided greater latitude for local initiative and market mechanisms than was heretofore possible. Top leaders of both the restorationist and transformationist schools seem to have regarded narrowing the scope of central planning as an experiment and to have reserved judgment as to whether it was a temporary expedient or a long-term change.

Since the first stage of decentralization did not go much beyond what had been championed by Chen and others in the mid-1950s and early 1960s (except in the countryside), it was relatively noncontroversial. Moreover, it was quite logical for the center to retain--some would say regain--tight control over those sectors of the economy considered critical for the attainment of developmental and political objectives. What was really important--such as key infrastructural projects, factories that generated high profits for the state, and facilities serving the military--remain firmly in the hands of central planners and administrators. Less critical activities--common consumer items for the domestic market, small coal mines, vegetable sales, etc.--are left to local governments, individual enterprises, or specialized households.

Over the past seven years, the logic and underlying motivation behind this approach--and the retirement, conversion, or neutralization of many restorationists--has led to a steady reduction in the scope of central planning and control. More and more facilities and activities have passed from central to local control. As ministries have transferred responsibility for and financial revenues from a growing number of facilities to local jurisdictions, the span of control has been reduced and administration has been made much easier. They have retained control over the largest, best equipped, and most productive facilities (measured in gross output) and shed those plants that chronically operated at a loss, required extensive and expensive technological modernization, and produced little of real importance to the national economy. This reform, like the personnel changes described above, was accomplished with minimal opposition and ill will. In general, large facilities have welcomed continued inclusion in national economic plans, priority access to imported technology and equipment, and other benefits of central control. Conversely, smaller facilities that were treated as second or third class citizens in the past and now have better opportunities to acquire technology, skilled workers, and markets have also welcomed their greater independence.

Although there has been a steady decrease in the number of activities and facilities directly controlled by the central government, the degree of control exercised by the center has shown periods of increase as well as decrease. For example, all enterprises, including those still under central control, enjoyed considerable leeway to develop markets, seek new suppliers, acquire new technologies, and dispose of their retained earnings during most of phase two. By 1982, however, key leaders had concluded that the devolution of authority had gone too far. One of the reasons they reached this conclusion--and responded by reasserting greater control--was dissatisfaction with the course of technology transfer.

As China abandoned the unrealistic targets and developmental strategy articulated in 1977-78 and scaled down plans to import entire plants equipped with the latest equipment available, officials began to call for "technological transformation" of existing enterprises. Special funds were established to cover retrofitting costs, and enterprises were given numerous incentives and methods to invest funds of their own in the retrofitting process. For a time, many enterprises even had access to foreign exchange which could be used to purchase foreign technology without obtaining permission from Beijing. The result of these and other changes and incentives was an expensive but uncoordinated drive to buy equipment, and extensive diversion of funds for "technological transformation" to capital construction projects that utilized old technology or, worse, were entirely nonproductive. Other problems arose because enterprises and foreign trade organizations were acquiring equipment with incompatible technologies, thereby further complicating the task of absorption.

To overcome these and other deficienceis, the center reimposed tighter restrictions on the import of technology and equipment. In doing so, officials acted in ways typical of the way policies have been changed in the 1980s; they addressed specific problems with specific remedies. They did not pull back from reforms granting greater financial resources and decision making authority to enterprise managers, for example. Rather, they left most of the other reforms in place and reinstituted tighter controls on the acquisition and expenditure of foreign exchange for technology transfer, introduced new review procedures to ensure that proposed acquisitions were "needed," and compatible with earlier purchases. They also took steps to reduce duplication and ensure that adequate efforts would be made to assimilate and apply new technologies.

Fluctuations and inconsistencies in general trends toward greater liberalization and reliance on market mechanisms, on the one hand, and toward greater central control and reliance on planning, on the other, are partly a reflection of the shifting fortunes of restorationist and transformationist sentiments in the leadership, but they also reflect a pragmatic, nonideological approach to problem solving and policymaking. The changes and adjustments that have been made since 1976, especially those made since 1978, seem to make sense to most officials and observers in China. On the whole, they have not been controversial because the problems they address have been real and apparent and, as importantly, the solutions have generally alleviated the problems they were designed to address.

This paper has argued that opposition to specific reforms and to the reform program in general has been held to a minimum by political skill and the fact that the reforms have achieved sufficiently positive results to retain the support of cadres and ordinary citizens alike. Even when the results have fallen short of what was hoped or anticipated, the gains have been sufficient to buy time for adjustment and reformulation of specific policies. Political leaders and the reform program have also benefitted from a constantly expanding pie that has brought concrete benefits to most regions, economic sectors, and societal groups. Real achievements have enhanced the legitimacy of the regime and this, in turn, has made it easier for the reformers to push ahead with further changes. Recent history has therefore made it likely that the reforms will remain in force for the foreseeable future. This rather sanguine assessment requires immediate qualification, however.

The reformers will continue to benefit from their past successes, but as has already become quite clear, maintenance and extension of the reforms will require increasingly difficult choices and will take longer to produce desired benefits. One important question for the future, therefore, is whether expectations will rise faster than the reforms and the regime can satisfy them. The ability of the regime to meet expectations and demands has been enhanced by the restoration of stability, greater legitimacy, and, ironically, the personal stature and increasingly charismatic authority of Deng Xiaoping. But the logic of the reforms and the experience of other nations suggest that the character of politics will change as the reformers are forced to adopt more zero-sum and redistributive policies. It may not be as easy to placate those disadvantaged by one set of policies by pointing to others which bring added benefits. How easily and how successfully China is able to cope with these new challenges will depend on how long Deng remains at the helm, how effective his successors are at playing the delicate political game entwined with the reforms, and, to some extent, the policies of other nations.

CURRENT TECHNOLOGY TRANSFER POLICIES: AN OVERVIEW

A complete catalog of the policies adopted by the reformers to facilitate the acquisition and absorption of technologies from both domestic and foreign sources would be almost as long as the list of all reforms introduced since 1976. One reason this is so is that from the earliest days of the post-Mao era political leaders have declared that advances in science and technology are the key to the four modernizations. After a brief period in which basic science was treated as equal in importance to applied science, engineering, and technology, commentaries and policies have devoted more attention to technology than to science. It is only a slight exaggeration to state that almost every one of the reforms introduced since 1976 has been justified--and perhaps conceived--as useful or necessary to promote technological change. At times declarations of the contribution that a given reform will make to the four modernizations are mere rhetoric, but at other times they appear to reflect the thinking of many senior officials. Although we cannot state with certaininty which possibility pertains in individual cases, but we can say that, over time, more pronouncements have referred explicitly to the "requirements of the worldwide technological revolution" and depicted modernization as if there were but a single path. This does not mean that China's leaders believe the PRC must follow precisely the same steps as have Japan, South Korea, or other successful Asian modernizers, but it does mean that they see more or less clear boundaries on either side of the path. Spokesmen continue to stress that China must and will devise its own strategy and course of development, but policies and the range of choice are becoming increasingly similar to those found elsewhere.

Since it is neither practical nor useful to list even a large subset of technology transfer policies, the summary presented here will focus on those measures that pertain most directly to imported technologies. First, however, it will be useful to recall two general characteristics of the current strategy of technology transfer. One is that China seems to be following a two-track strategy that combines centrally targeted acquisitions by agencies of the central government responsible for obtaining critical equipment and know-how for keypoint projects and enterprises, and a shotgun, market-driven approach for the acquisition of equipment and technologies by non-key facilities and the purchase of non-key items by keypoint enterprises.

The second feature of the current strategy is that it places equal emphasis on acquisition and absorption. Whereas in the past assimilation of new equipment and techniques was regarded as a trivial matter, would-be purchasers are now enjoined to make sure that what is acquired can be mastered within a reasonable amount of time. This is supposed to mean, inter alia, that the acquiring firm has adequate technicians to maintain and, if possible, copy the equipment involved, that the workforce can understand and master new procedures, and that the requisite supporting factors (e.g., complementary machinery, reagents of sufficient purity, adequate supplies of fuel and power, necessary cooling, heating, or water purification facilities) are available.

Guidelines governing technology acquistion (including and especially foreign acquisition) have also become clearer. Central planners and their counterparts in lower-level planning and financial agencies, the People's Bank, and trading companies, as well as other bodies empowered to review technology import requests, are supposed to pay attention to the following considerations:

1. Does the equipment or technology satisfy a critical need in a high priority field of endeavor (e.g., microelectronics, telecommunications, computers, energy, or bioengineering)?

2. Does the item satisfy a critical requirement in a key national (or local) project?

3. Does the item facilitate the production of a commodity (raw material or manufactured good) which can be exported to earn foreign exchange?

4. Can the item be absorbed or mastered without expensive or difficult to obtain complements (e.g., training, equipment, spare parts)?

5. Will the item make a significant contribution to China's economy in the near term?

6. Can the item be acquired, immediately or with minimal delay and investment, from a Chinese supplier?

The conditions enumerated here are neither rigid nor exhaustive, but they are articulated (albeit not in the terms used here) sufficiently often that they are likely to be applied with increasing frequency. That they can be applied more consistently and more effectively is, in part, a consequence of the many reforms that have been adopted since the Third Plenum. For example, limiting the direct role of the central government to those sectors and activities critical to the success of the developmental strategy of the Deng regime means that efforts to obtain foreign technology for those facilities will have both high priority and political importance. Efforts to restrict access to technologies deemed critical by the center will have an immediate and possibly profound impact on domestic politics and, possibly, political relations with other nations.

The sectors and technical fields reserved to the central government include major infrastructural projects such as those for energy, transportation, and telecommunications; national priorities such as microelectronics and computers; and military systems and equipment. This paper has not commented on the role of the military or defense industries in detail because that is the subject of a companion study, but it should be noted that the acquisition of equipment and technology for the PLA is tightly controlled by the central government. The center (here the National Defense Science, Technology, and Industry Commission) plays the decisive role in targeting technologies with important and urgently needed military applications. Not all dual-use technologies are targeted for acquisition and absorption because they have military applications, but, given the competition for foreign exchange and other scarce resources needed to absorb new technologies and equipment, it certainly does not hurt to be able to point to possible military applications.

Assigning greater authority and more resources to lower-level officials, especially factory managers and chief engineers, means that more technical decisions are being made without interference from the political system. It also means that targets for acquisition have been carefully selected, can probably be utilized effectively, and that preparations have already been made to assimilate the technology once it has been acquired.

Reforms making enterprises responsible for their own profits and losses, making local governments more dependent on tax revenues from plants in their area, policies linking worker bonuses to profit levels, and many other policies contribute to a climate in which greater care is taken to ensure that technologies procurred on the domestic or international market are appropriate to the needs and capabilities of the recipient. The same is true of measures governing the supply of fuel and power and rewarding installation of energy-saving equipment. Indeed, the special importance attached to energy conservation provides additional incentives to retrofit existing facilities, alter production practices, and limit new construction in ways that make for greater energy efficiency. This has both positive and negative consequences in China's still imperfect market. For example, saving energy still means primarily saving BTUs or kilowatts rather than reducing costs. Investments that save energy may be made even though the technological changes involved do not raise the quality of output. Saving energy while producing more of an unwanted commodity is not particulary helpful.

Manpower reforms, including those permitting scientists and engineers to accept contracts for work performed outside of normal working hours, and to change jobs permanently or for temporary periods, and other reforms allowing firms to compete for experienced professionals and recent graduates are beginning to make it easier for enterprises to obtain informed advice about what equipment or technologies to purchase, and how best to absorb them. Thus, for example, if a firm needs mechanical engineers to help identify and absorb specific types of technology, it can go out and hire them. Like the many other changes that have occurred under the broad heading of S&T reforms, those increasing the mobility of technical specialists are important but their impact on technology transfe must not be exaggerated. This note of caution is necessary because Chinese commentators typically suggest that the myriad changes designed to foster creativity and entrepreneurial behavior are much more effective than is actually the case. If these policies remain in effect--and there is a good possibility that they will--they could have a significant impact in the future, but only if the other reforms mentioned in this paper also remain in effect.

The success of efforts to acquire technology from abroad will also be determined by the content and efficacy of China's trade and investment policies. Since 1979, Beijing has introduced a steady stream of trade reforms and economic laws designed to attract foreign investment. In the first part of this decade, spokesmen often treated trade and investment as totally separated from technology transfer. Now however, officials appear to have learned that few transfers of technology occur for reasons of altruism or foreign aid; most occur as part of commercial transactions. Companies own and control most technologies; their decisions to sell, license, or otherwise make available proprietary information are made in the context of overall business strategies and in response to commercial opportunities. China's leaders have been surprised and disappointed by the slow pace of technology transfer and by the limited number and character of foreign investments in the PRC. Their disappointment and dismay have increased as they have taken ever more steps to encourage investment. Since China has moved very far from its closed-door, exclusionary and, by Western standards, highly unreasonable trading practices, it is understandable that those pushing for reform and the open door should be disappointed by the results. In their view, they have done much but accomplished little.

Despite the openi of more coastal cities and economic zones, adoption of a patent law, and s ilar measures, China still has not done enough to persuade foreign busin smen to invest heavily or to transfer significant technologies to the PR Investing in China is still a risky business. Assimilation of new eq ment and technologies has proven difficult because of conservatism and lack discipline in the workforce, shortages of engineers and technicians, and r trictions imposed by COCOM and other agencies. Moreover, limited acce to China's domestic market, the necessity for the foreign partner to bea most of the risk and upfront financial costs of any venture, and growing p tectionism that could make it impossible for the joint venture to recover cos induce caution in the internatioal business community. This cauti , and the difficulty China has had and will likely continue to have in br g about more fundamental changes in the economic system (especially pri reform and opening the market to foreign goods), will pose formidable obsta s to the acquisition of tecnology for years to come. So long as these obsta es remain, the S&T reforms, however laudable and important to China's s entific community, will have only limited impact.

GENERAL CONCLUSION

The foregoing ana sis of developments since the death of Mao suggests the following general nclusions about the stability and future course of China's technology tra fer policies:

1. China's curre leadership, characterized here as a coalition of reformers with differe views on the proper pace of reform, seems to have accepted the idea of a rldwide technololgical revolution with certain

universal requirements. In order for China to take advantage of the NTR, they seem to argue, it is essential to "open to the outside world" and invigorate the domestic economy. It is further necessary to reduce administrative interference in decisions that are inherently technical in nature. It is also necessary to create the requisite conditions for acquiring and assimilating new technologies. Virtually every reform introduced during the past decade has been justified as necessary to facilitate the transfer of technology. If efforts to acquire and assimilate technologies prove unsuccessful or technology transfer fails to produce the anticipated results, there will therefore be a strong initial predisposition to make still further reforms.

2. By narrowing the scope of centrally directed activities to make it easier to plan, monitor, and control developments, the central government has increased the importance of doing well those tasks which it has reserved to itself. The rationale for central control, state management of key sectors of the economy, and, in a fundamental sense, Party rule, is predicated on an assumption that central control will enable critical sectors and enterprises to outperform those devolved to lower levels of the system and relying more heavily on market mechanisms. This same rationale suggests that top leaders believe China can and will modernize more rapidly than Japan, South Korea, and Taiwan because the degree of central control is greater in China and because only China is led by a Communist Party. Since the central government has reserved to itself control over the most modern and most technology-intensive segments of the economy, it is particularly sensitive about commercial or foreign governmental efforts to restrict access to technology for key projects and priority sectors. Thus, for example, US and COCOM

restrictions on the export of technologies that China wants--and feels it needs--to modernize its telecommunications system are especially sensitive because they jeopardize more than a single project or industry; they threaten the capability and legitimacy of the entire reform program and the regime that has put the reforms into effect.

3. The fact that the central government and functionaries at lower levels of the system are increasingly sensitive to the problems of assimilation and the need to avoid ill-considered acquisitions of technology means that future efforts to procure equipment, form joint ventures, and so forth will be better informed and, possibly, less plagued by the kind of problems that have surfaced to date. It also suggests that when China--the central government or an individual manager--has decided what technology to acquire, that decision is likely to be a firm one. This should simplify commercial negotiations, but it will also increase the likelihood of harsh Chinese reaction if transfers are blocked or delayed.

4. Opponents of reform and leaders who have not subscribed to the idea that the NTR requires fundamental transformation of the system China established under Soviet tutelage in the 1950s have been defeated and are not a significant political force. Chinese leaders continue to jockey for power and to have different policy preferences, but there appears to be near unanimity on the need for technological change and substantial agreement about the kinds of reform necessary to achieve the four modernizations. Sharp differences exist, but they center on the pace, timing, and sequencing of reform and not on the basic direction the reforms should take. Both the

m erates and the reform-mongers are concerned about unwanted side effects of t reforms--spiritual pollution, corruption, abuse of position, and loss of e husiasm for political study, for example--but they both also seem persuaded t t these side effects can be managed well enough to persist in the opening t the outside world and the transformation of the economic, social, and p itical system they had helped to create.

5. China's technology-based strategy of modernization and the prevailing i erpretation of the new technological revolution pushes the country toward t OECD nations and away from the centrally planned economies. The name of t game is rapid technological progress; the countries with the best track r ord are the United States and Japan with the West Europeans and Canadians r far behind. The Soviet Union and other COMECON states, the Chinese say, h e an unimpressive record and seem to be falling further behind. This does r mean that China will not attempt to acquire technology from the Warsaw P t; indeed, it will almost certainly do so in order to modernize the e ipment and facilities acquired in the 1950s. It does suggest, however, t t China sees its own future as tied more closely to the United States and J an than to the Soviet Union.

For these and many other reasons suggested above, technology transfer w l remain near the top of China's political and policy agenda for at least t remainder of this century. That will make it a visible and politically-c rged subject, and Chinese leaders can be expected to react strongly to any a ions by foreigners that can be construed as a deliberate effort to i erfere with China's quest for modernity.

ALTERNATIVE DESCRIPTIVE AND PREDICTIVE MODELS

By focusing on the interplay of personnel and policy change during the post-Mao era, the analysis presented above has developed a process-dominant model of Chinese politics. Although not fully articulated, this model suggests that reforms, and policy change more generally, evolve from a continuous process in which issues and decisions are shaped by the cumulative effects of previous rounds. Skillful players and chance developments influence both the process and the outcome of specific decision making rounds, but the process itself tends to be more influential in determining the content and efficacy of policy decisions. According to this interpretation or model of politics and policy making, Deng Xiaoping enjoys unrivaled authority and influence not because of who he is but because of the way in which he--and others--have reshaped the policy making process. Mastery of that process has given him growing charismatic authority; he did not have that authority until he had mastered the process.

Although the process-dominant interpretation of developments has considerable descriptive utility, its value as a predictive model has yet to be determined. As noted above, the process-dominant model suggests that reform (i.e., marginal policy and structural modification) will continue, but that the magnitude of change from one stage to the next will decrease. Among the factors contributing to essential stability despite continuous policy adjustment are the constraints imposed by previous coalition-building efforts, the expectations of and promises made to numerous bureaucratic, social, and political constituencies, and the fact that maintaining and improving the new system has replaced creating a new system as the principal political challenge.

Several alternatives to the process-dominant model have been proposed to explain recent developments in China and, more to the point, to predict what will happen in the future. The pages that follow will examine four alternatives which have been or could be developed into systematic descriptive and predictive models. The reasons for doing so are to note where they differ from the process-dominant model, and to expand the list of factors that could lead to outcomes different from that suggested by the foregoing analysis. Since space limitations preclude detailed analysis, the discussion that follows focuses on generic types and does not address the agruments of specific analysts.

Deng in Command. Most Chinese and Western commentaries on China's reforms ascribe a decisive role to Deng Xiaoping. Without Deng, reform would have been impossible; whether the reforms can survive his passing is uncertain. Two analaytically distinct but complementary factors are frequently cited to explain why Deng plays such a central role. One factor is his unrivaled stature as China's preeminent leader. That he would enjoy this status was far from certain in 1976 when he was once again in political eclipse. Nevertheless, during the past four-five years he has eclipsed Chen Yun, Li Xiannian, Ye Jianying, and other Party elders and now commands unchallenged--and almost complete--authority. That he has attained this stature is partly a function of good health (potential rivals have been less fortunate), but it is also a function of the second factor, namely, his political skill and will. Unlike Chen Yun, for example, Deng is a consumate politician. He knows how to play to the gallaries, but, more importantly, he also knows how to win in the backrooms of politics. By all accounts, he is extremely adept at winning over or outmaneuvering opponents. Moreover, he appears to be an effective leader who commands loyalty from his supporters and offers specific marching orders as well as a vision of what China can become.

These personal attributes are reinforced, it is said, by a cultural and ideological need for a single strong leader. To the extent that Chinese tradition still holds sway--as it seems to do in the countryside, for example--Deng has succeeded Mao as China's latest emperor. For those in the Party who believe that effective leadership of the revolutionary vanguard requires a single strong leader (in Mao's succinct formulation, "If there were no Stalin, who would give the orders?") Deng fills that role. He is, in other words, the perfect man for the times and the situation.

According to this analysis, China has embarked upon the road of reform because Deng has determined that it is necessary to do so and has the political stature and authority to get what he wants. Fundamentally, then, the reforms rest on Deng's charismatic authority and political skill. For the reforms to survive him, therefore, Deng must ordain others who will inherit his stature and authority. As many inside and outside of China have noted, Deng has taken steps to ensure that his successors will share his power as well as his vision of the future. But Hu Yaobang and Zhao Ziyang just do not appear to have Deng's style or political instincts. There is real question, therefore, that they and others likely to play a role in the post-Deng era will be able to persist and to triumph in the face of opposition from those who dislike the reforms.

Those concerned about the future of the reforms after Deng's passing--including many in China--see problems ahead on two fronts. On the political front, opponents of reform, often labled conservatives, are depicted as in temporary retreat but prepared to pose a formidable challenge as soon as Deng is gone. Since his successors will lack Deng's skill and power, bureaucratic, generational, regional, and ideological opponents of reform will attack with renewed vigor and enhanced prospects for success. The second problem they will face derives from the reforms themselves; the very success of the reforms will raise expectations and increase the demand for successful governmental performance beyond what can be satisfied. Deng can deal with such side-effects because of his stature; lesser leaders will be less capable of doing so.

This approach or model has merit, but it probably overstates the significance of Deng's role. As noted briefly above, those who see the reforms as based on Deng's charisma confuse cause and effect. Deng has acquired charisma because the reforms have proven quite successful; the reforms have not succeeded because of Deng's charisma. Over time, the reforms have acquired a momentum of their own and a growing constituency of beneficiaries and supporters. Also, support for Maoist and Soviet alternatives has eroded further with the passage of time and the fact that the Soviets have embarked upon a reform program of their own. Finally, the model may exaggarate the importance of a single charismatic leader to the Chinese political system. Distaste for the excesses of Mao's personality cult and the fact that there is no clear opponent of reform with the potential to crystalize opposition in the post-Deng era. Deng's successors may not have his personal authority, but possessing such authority may be less than an essential condition for success in managing the challenges of the future.

Power Struggle. This approach subsumes factional, bureaucratic, generational and other competitions for power and resources that relegate policy matters to secondary importance. What these approaches have in common is a tendency to depict rivalry among competing groups as essentially a struggle for power in which issues and policy options are merely instruments and outcomes of a more fundamental contest. Analyses using this model of politics generally refer to the contest between "reformers" and "conservatives," but other cleavages include those between the military and civilians, Party versus state, technocrats and ideologues, coast and interior, heavy and light industry, and so on. Some cleavages center on policy issues, others do not. The division between struggles for the sake of power and struggles for the power to implement preferred policy alternatives is, of course, imprecise.

Cleavages and competion of this sort are found in all political systems, but are often depicted as having a special character in China where debate over policy issues has often taken the form of a titanic struggle between good and evil with dire consequences for those on the losing side. Since losing has often carried heavy costs, winning is perhaps more important than in other political systems. Moreover, the political process in China - like other social relationships - is frequently shaped by the desire for revenge; since winners have seldom treated losers graciously, losers are anxious to retaliate if they can turn the tables on their opponents. Indeed, some would argue that revenge can be a stronger motive than the desire for any particular policy alternative.

Viewed against this background, efforts to minimize intra-elite differences and the costs of losing a policy debate characteristic of the post-Mao era are anomalous and the product of very special circumstances, primarily the especially distasteful memories of the Cultural Revolution and the shared intentions of Deng and other senior officials. Only the absolute imperatives of restoring political authority and enhancing economic performance after a decade of near chaos impelled leaders to bury political differences--albeit only temporarily--and to forge an uneasy coalition that obscures personal animosities, factional rivalries, and other deep divisions.

This coalition is inherently unstable and destined to become less stable as it is forced to confront the issues ahead.

Two such issues that will severely strain the bonds of coalition are the treatment to be accorded children and other relatives of senior leaders judged guilty of criminal acts, and the need to make more decisions with redistributive consequences. The first issue could prove most destabilizing in the short run because cracking down on corrupt behavior even--especially--if perpetrated by officials and their families has become a major plank in the Party's platform. Having asserted that no one is above the law and defined many once commonplace activities as corrupt, the leadership must now live with the consequences. It should be noted, however, that this issue appears to have been used by at least some senior officials to attack their opponents. Once started, this practice could prove very difficult to check. Even if the unstable coalition can be held together through the current anti-corruption campaign, it could fall apart as it becomes necessary to make more difficult choices concerning the allocation and reallocation of resources. Budgetary constraints will force the Center to concentrate available resources on expensive "key" projects, but doing so will limit the ameliorating effects of porkbarrel distribution.

If the coalition and present rules of the game come unstuck, the future is uncertain. Paralysis and frequent policy shifts with deleterious effects on China's economy and relations with other nations seem more likely than a return to any particular program or policy set developed in the past, but no one can be certain. If more were known, this model might predict which of many competing groups would emerge victorious and what policy preferences that group would hold: in the event, however, it predicts merely uncertainty and instability.

Reform Generated Instabilities. Whereas the process-dominant and Deng in command models are primarily descriptive with certain implications for prediction and the power struggle model contains elements of both description and prediction, the approach or model discussed here has little descriptive value. Like the external determinants model discussed in the next section, the reform generated instabilities approach is predictive rather than descriptive. The central premise of this approach is that reform and the kind of fundamental systemic changes being introduced in China are inherently destabilizing and that they will, in time, generate frictions and pressures that will erode the political stability that has been so carefully nurtured during the past decade.

The reform generated instabilities model looks to the experience of other nations as well as to China's past. The argument goes as follows. The explicit objective of the reforms is modernization; reform is therefore a means rather than an end in itself. To the extent that the reforms are successful in bringing about comprehensive modernization--the four modernizations in Chinese parlance--they will sow the seeds of future instability. Around the globe and down through the centuries, nations and political leaderships have found it difficult to negotiate the transition to modernity. The requisites of modernity--specialization, communication, mobility, education, etc.--challenge existing social practices and mechanisms of control. Attributes of modernity, such as decentralized decision making authority, dispersed wealth and power, and the increasing power of those with technical skills, often conflict with the needs and expections of older economic and political hierarchies. One of the most fundamental contradictions is that between the monopoly of political power and the pluralization of economic and social power.

According to this approach, China's fragile consensus and the ability of political leaders to manage the process of modernization has yet to face the kinds of challenges that have undermined many stronger regimes. In a sense, those adopting this approach would argue that it does not matter whether the process-dominant, Deng in command, or power struggle interpretation of past developments is correct; the outlook for the future is the same. Others would argue that it does matter which of the descriptive models is most accurate because they suggest different capabilities for dealing with the challenges ahead.

In addition to the universal stresses and strains that have accompanied modernization elsewhere, China must cope with the effects that reform has had and will continue to have on factors and relationships with special importance in the Chinese context. Thus, for example, the leadership must manage the increasingly rapid and destabilizing changes in social, economic, and political relationships in a cultural setting that prizes stability and fears instability (luan). Chinese fear of luan is well-documented and seemingly all-pervasive. This fear may be tempered as change becomes more common and more clearly beneficial, but one must wonder whether developments will reach a point at which the populace values stability and predictability more than continued economic growth.

A second factor of special importance in China is the ethos of equity--at times egalitarianism--fostered during most of the Maoist period. There is a strong sense in China that changes should not leave anyone worse off merely because doing so will ultimately lead to a better situation for everyone. This sense or ethos will make it difficult to close unprofitable factories, remove subsidies for food and housing, and to accomplish other announced objectives of the reformers. If the reformers push ahead with these and similar policies, they may begin to encounter greater resistence. Closing an inefficient factory is acceptable in theory; it takes on a different significance when it affects a member of one's own family.

A third element in the reform-generated instabilities model is what has been called the curve of rising expectations. Basically, this theorem postulates that people will tolerate poor to mediocre conditions (social, economic, and political) for a long time if there seems to be no prospect for improvement, but that once expectations have been raised, they begin to demand improvement at rates that often exceed the ability of the system or the political leadership to satisfy them. This is a variant of the "the more they have, the more they want" phenomenon. It is relevant in China precisely because the post-Mao leadership has not only promised specific improvements, it has actually begun to make good on those promises. Increased access to the media, contacts with the outside world, and greater differentiation inside China will heighten pressures for more progress at a faster pace. Whether the system can satisfy demand fast enough is far from certain. It should be noted in passing that the idea of a curve of rising expectations was developed to explain why people so often rebelled after their objective situation had begun to improve.

The approach or model outlined above suggests that China's leaders will find it difficult if not impossible to manage the transition and that now-dormant cleavages (e.g., between regions, generations, bureaucratic groups, and factional alignments) will once again disrupt the political process. At first glance, such a prediction contrasts sharply to the generally sanguine prediction suggested by the process-dominant model and requires a brief explanation. The first point that should be made is that both models suggest that further reform is more likely than an effort to restore the organizational forms and procedures of the past. Thus, while reform-generated instabilities may well lead to confusion and even paralysis, they probably will not lead to restoration of a Soviet-style economic system. The real question is whether the Center will hold in the face of increasing centrifigal pressures. Earlier sections of this paper argued that the process of reform has alleviated many points of friction and reduced the likelihood that pre-existing groups will conclude that there is more to be gained by opposing than accepting further reform. If that is is correct, the political system should be able to manage the additional and inevitable challenges that lie ahead. If not, or if demand for further change and benefits escalates more sharply than now anticipated, the political system could fail. Should that happen, intervention by the military would probably be inevitable.

China's Fate Determined by External Events. Although none of the approaches summarized here qualify for the title of predictive model, this one is particularly rough. Nevertheless, it does alert us to the fact that the success of China's reforms and hence the course of future domestic and foreign policies could be altered significantly by developments beyond China's borders and over which it has little control. For the sake of simplicity, we will consider three ways in which external developments could complicate or alter the course predicted by the process-dominant model.

China's leaders frequently affirm that their nation's reform and modernization programs require a peaceful international environment. Without doubt, those programs would suffer if China were to become embroiled in a major international conflict--global, regional, or with either of the superpowers. However, since China is doing what it can to reduce still further the already low probability that it will be drawn into a major war, the likelihood that reforms will be derailed by military conflict involving

China seems remote.

Policy and political stability in China could also be affected by severe dislocation of the international economy. Since the opening to the outside world and participation in the international economy are central to the developmental strategy adopted by post-Mao leaders and China is becoming increasingly dependent upon and enmeshed in the international economy, it will increasingly be affected by developments elsewhere in the system. Chinese commentaries make clear that at least some officials are concerned about this growing dependence and vulnerability to the vicissitudes of the world economy, but the size and relative autarky of China's domestic economy suggest that it will be a long time, if ever, before China becomes as vulnerable as most other nations, developed and developing. Nevertheless, unaticipated problems in the global economy, particularly those impeding China's ability to earn foreign exchange and import technology and equipment, could seriously jeopardize attainment of Beijing's economic and social objectives. This, in turn, could undermine stability.

A third way in which external developments could affect China might result from a breakdown of the multilateral trading system that has been in effect throughout the post-War era. Growing protectionist sentiment, the difficulties inherent in extending GATT provisions to cover services as well as goods, and other strains could result in a partial retreat into bilateralism. As a highly protectionist country, China could find it difficult to negotiate bilateral agreements with the principal trading nations. A variant of this scenario could arise as a result of concerted efforts by the US and other OECD nations to adopt trading practices designed to alleviate the huge debt burdens of Latin American states. Preferential treatment for others will make it more difficult for China to compete. Not only would this derail the current strategy of economic growth, it would call into question the wisdom of the entire policy of opening to the outside world.

The impact of these and other international developments will be mediated through the political system. How external developments are perceived and their impact on China's policies will be determined by the domestic context at the time they occur. Thus, for example, if protectionism closes markets to China at a time when China's economy is experiencing difficulty for other reasons (e.g., excessive investment, inflation), advocates of a greater role for central planning could exercise greater influence and win more support/concessions than might otherwise be the case. The list of such examples could be extended almost indefinitely; the point, however, is that short of a cataclysmic war, developments in the international environment will have only an indirect effect on China's policies.

KEY VARIABLES

The transformation that is now under way in China penetrates and affects virtually every facet of political, economic, and social intercourse. To achieve the ambitious developmental goals articulated by China's leaders will require nothing less than the serial or simultaneous transformation of every institution and relationship in the country. Success in every policy area requires at least partial success in almost every other; the web of interdependence is greater now than at any time in the history of the PRC. In this sense, all developments are critical, but common sense as well as an operational need for parsimony requires identifying some variables as more important than most others. Preceding pages have identified numerous factors that have shaped or will shape future policies and political developments; this section will reduce that number to just five variables which could hold the key to what happens and to our understanding of future developments.

Economic Performance. Perhaps more than any other factor, economic performance will determine the viability of the reform program as a whole and the developmental *cum* political strategy of the reformers. Faced with a crisis of legitimacy in 1976, post-Mao leaders made a conscious decision to base their own, the Party's, and the entire regime's legitimacy on the as yet to be demonstrated capacity to improve economic performance, raise living standards, and enhance China's security. Economic performance is the key to attaining the other two objectives; if the economy is growing, output quality is improving, and constituencies from ordinary citizens to the military receive tangible benefits, both politics and policy should remain relatively stable. If the economy begans to stumble--and that could mean growing less rapidly than anticipated or with unacceptable gaps between sectors--strains in the ruling coalition will increase and pressures to try something else will intensify. The tricky element here is that objectively good economic performance could fall short of what is expected by society as a whole or by key sectors such as the military. If things go reasonably well, the more sanguine predictions of the process-dominant model are likely; if not, the more confused and disruptive predictions implicit in the power struggle and reform-generated instabilities models become more probable.

Price Reform. Many important economic changes have already been implemented in China, but the efficacy of those reforms is heavily dependent on real reform of the country's irrational price system. The need for fundamental and far-reaching reform of the price system is acknowledged by almost everyone in authority in China, but the potentially disruptive consequences are such that implementation has been delayed repeatedly. In some ways, this is the real litmus test of the regime's commitment to reform--

and its confidence that unwanted consequences can be held in check. If - or when - price reform is carried out, it will signal a phase of both great self-confidence and vulnerability for the leadership. If they can make the reforms stick and manage the consequences, chances for long term stability and the success of the reforms will improve markedly.

Crackdown on Corruption. Just as price reform is a major indicator of the regime's commitment to economic reform, the crackdown on crime and corruption is a litmus test of the leadership's commitment to the rule of law. If the leadership follows through on its pledge to ensure that everyone--including Party members and the children of senior officials--is equal before the law, it will gain additional and important support from the public. Doing so will also alter significantly the relationship between the Party and the people. On the one hand, it will restore some of the Party's lost luster and thereby enhance its capability to play an effective role in China's modernization. On the other hand, however, removing the special privlege that has accompanied membership in the Party may further diminish already waning interest in joining the CCP. With alternative paths of upward mobility and a disproportionate ratio of burdens to benefits, many young people, especially those with other options, find Party membership unappealing (see below).

Another aspect of the crackdown on crime and corruption merits special attention, namely, the extent to which the leadership is able to follow through on and/or contain allegations of misconduct by members of their families. Family loyalty runs very deep in China; sacrificing a child or sibling in the name of legal principle or China's modernization will not be easy for members of the elite. Carrying out promises on this issue could severely strain the bonds that now hold together members of Deng's coalition and moderate competition between those who now hold sway and those who find themselves in the loyal opposition. If, however, the leadership is able to crack down on enough people with highly-placed relatives to prove that the anti-corruption drive is sincere without doing irreparable harm to the coalition, prospects for future stability will be improved.

The Party. Despite its nominal preeminence, the Party does not yet have a clear role to play in post-Mao China. The separation of Party and state functions, substitution of technical and economic for political criteria and circumscription of the role of Party cadres, and the visibility and attractiveness of alternative paths to power, prestige, and wealth have diminished the stature and impact of the Party as an organization. At the moment, the Party's principal role appears to be ensuring that government and Party policies are implemented throughout the system. In other words, the Party has become a monitor and facilitator rather than a leader. Will the Party's role diminish further as economic reform leads to further decentralization and pluralization? Or will it find a new identity and new purpose in the evolving political and social situation? Can the reforms succeed and stability be maintained without an effective Party? These and many other questions must be asked, but before we can ask them, we must have a better indication as to the future role of the CCP.

Integration into the World Economy. The two primary objectives of Chinese policy, the leaders have claimed, are to invigorate the economy and open China to the outside world. These objectives are linked, invigoration of the domestic economy is dependent upon access to foreign goods, markets, and technologies. Just how well China is able to restructure and upgrade its economy to meet the demands of the international market will be a key indicator of how well the reforms are going and, therefore, of future developments. China's ability to join the world economy will be determined by both domestic and external developments. Infrastructural improvements, greater labor discipline and quality control, and similar developments are essential not only for participation in the international market, but also for the success of purely domestic economic activities. Therefore, active and extensive participation in the world economy would signal a much stronger domestic economy. Similarly, greater participation by foreign firms would signal improvements in the business climate in China and thus changes in such areas as market access, repatriation of profits, protection of intellectual property, and so forth. These changes, and the implications they would entail for China and the international community are enormous. Finally, the degree and character of China's participation in the global economy would indicate the attitude and capability of other nations to accomodate to China's needs and the impact of the world's largest developing nation.

CHINA'S FOREIGN POLICY, BEIJING'S MILITARY MODERNIZATION AND AMERICAN POLICY ALTERNATIVES

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China's Foreign Policy, Beijing's Military Modernization, and American Policy Alternatives

Thomas W. Robinson

Early September 1986 marked the tenth anniversary of Mao Tse-tung's demise as well as the end of an extraordinary ten years of very rapid Chinese modernization under the leadership of Deng Xiaoping. That decade, perhaps the most hopeful and surely the most progressive since 1949, definitely set the country on the road to full modernization by the middle of the next century. For a nation that had more or less been wasting its time, since 1842, over the question whether to modernize or not and, since 1927, how, that was no mean achievement. Surely there would be slowdowns and deviations from the exceedingly rapid pace of the.post-1976 decade. But it was highly unlikely that a post-Deng leadership would derail the engine of economic modernization as it pulled ahead its trainload of improvements in every sphere of Chinese life.[1]

Changes were also apparent in Chinese foreign policy, many of them the result of the economic surge forward and the attendant modifications in admininstration, attitudes, Party policy and composition, and popular perceptions. In particular, the determinants of Beijing's approach to the world during the now-classical Maoist period differed from these that came to dominate the later period. A comparison was in order, for once the shift in foreign policy attenmdant upon the new domestic situation (as well as the altered international environment) was understood, it would be possible to consider how military force modernization--conventional and nuclear--would influence China's capability to play an increasingly important role in the Asian and global security situations; how the country would likely project its forces abroad; and in general the degree to which Beijing would seek to use its new martial strength as a means to obtain its policy goals.

I. Determinants of Chinese Foreign Policy Under Mao

The historic (e.g., 1949-1976) sources of Chinese foreign policy were well known. Six factors--three domestic and three international--combined to determine the details of Beijing's approach to specific issues and states. The domestic component--the primacy of politics, weight of the past, and the importance of ideology--most of the time was sufficiently important to explain most of the variation in foreign policy outputs.[2] The reason was the newness of the Chinese revolution and the role of Mao. Indeed, it was revolutionary politics, as structured and symbolized by Mao, that so strongly set the direction amd informed much of the content of China's approach to its international environment. The facts that the Chinese Communist Party had long since become a Leninist institution and possessed a strong leadership group with a well thought-out set of goals were, together with the then pliable nature of the Chinese population, chiefly responsible for setting the country from the beginning on the course of national unity, socialist revolution, export of Maoist ideology, anti-Americanism and pro-Sovietism, and restoration of Chinese primacy in Asia. It was the Mao-induced domestic political cycle that induced so many of the swings in foreign policy--from the excessive closeness to Moscow during the early revolutionary years to calling a crisis in the Taiwan Straits during the Great Leap Forward to the over-reaction to alleged Soviet perfidity during the 1959-1962 "lean years" to the isolationism of the Cultural Revolution itself.[3] And it was Mao's own personality--his campaign style, his insistence on revolution uber alles, his megalonania, his paronoia--that informed much of the foreign policy decisionmaking of the pre-1977 era.[4] Economic development did count for something, obviously, but it was politics and Mao that occupied center stage. Only at certain times--mostly when economic opporturnity beckoned (or necessity threatened) and when Chou En-lai was at the foreign policy helm (as in the Geneva Talks in 1954, the Bandung Conference of 1955, the post-Great Leap recovery years of the early 1960s, or the negotiations with Henry Kissinger a decade later--did one perceive a different style and another, more rational and deliberate, foreign policy orientation.[5]

Politics was "where it was at" during Mao's time. In addition (indeed, as part of the dominance of domestic political elements over Chinese foreign policy), the weight of the past exerted considerable pull. Mostly this meant the formative experience of the 1921-1949 period of the Party's formulation, experimentation, and application of its basic policies and its discovery through trial and error of the "correct" path to revolutionary power.[6] Two aspects of this maturation process were important for foreign relations after 1949. One was the reification of the Maoist strategy for revolutionary success into a formula that could be applied to the international, as well as the domestic, enviromment. Set forth in definitive form in the Lin Piao pronunciamento on people's war in 1965 (and not renunciated since, the only one of Lin's putative writings to continue in Party favor), this formula drew a parallel between the Chinese revolution and the dramatis personae of the time (the Party, the Kuomingtang domestic ememy, the Japanese external enemy, the masses, the correct [Maoist] strategy, etc.), on the one hand, and the characters later met on the world stage (China, the Soviet Union, the United

States, the Third World, militant Maoism, etc.), on the other.[7] It formed the basic Chinese approach to the "Third World" and lasted, with modifications, to be sure, much into the post-Mao era.[8]

The other formative element in the Party's revolutionary past was even more important. It involved the Party's early discovery, and bitter experience when it violated the rules, of the balance of power. The most elementary and vicious form of the balance is a three-element game in which the constantly weakest member must continually move to ally and then re-ally itself to the second strongest member in order to avoid destruction at the hands of the strongest or a combination of the other two.[9] The Party was successful when it pursued such a strategy--in the early 1920s with the Kuomingtang and against the warlords, during the anti-Japanese War of the 1930s and 1940s, and again immediately after the end of World War II, when it sought to use the Soviet Union and (principally) the United States against the Nationalists. When it had to face an enemy with no intervening player, it suffered disaster, as in the aftermath of the Northern Expedition in 1927.[10] The Party learned the lesson well emough by 1949 that Mao's first foreign policy act was to sign an alliance with the Soviet Union against the United States, thus guaranteeing Beijing's security for more than a decade.[11] And when it forgot the lesson of triangular international relations, as it did in 1969, it found it had no choice but to seek security in the only quarter it could find such, in Washington, D.C.[12] As a result of two-thirds of a century of participation in a three-sided balance of power, then, China became a firm believer in security as a function of power, alliance, and manipulation of friends and ememies.

The influence of the more distant past also counted in Maoist policy. Thus, the fact that China was ecomomically backward, that it had suffered from Western imperialist overlordship, and that it had historically a very different history in Asia of cultural supremacy and political centrality all stood at the base of several post-1949 goals: development, anti-imperialism, and national assertion. One could even proceed farther back into Chinese history to find origins of more recent foreign policy orientations. Thus, not only did the Maoist military component of revolutionary export owe much to the influence of ancient Chinese military strategists such as Sun Tzu and to the heroics exhibited in such writings as the Romance of the Three Kingdoms and Water Margins, but the general direction, and some of the employment details, of Chinese nuclear weapons strategy found their origins in the entire corpus of Chinese military history over two and a half millenia.[13]

The third domestic determinant of Chinese foreign policy was ideology. Although at times difficult to evaluate in terms of its contribution to the whole, it was clear that Marxism-Leninism-Mao Tse-tung Thought informed the general direction of policy, at times carried matters to extremes, and delayed or quickened (depending on where Chinese was in the domestic politics-induced foreign policy cycle) changes that stemmed more directly from other quarters. Thus, China carried its adulation of the Soviet Union during the early 1950s far beyond what was required for reasons of security within the strategic triangle; made total its rejection of Moscow after the break in 1960; went to anti-American extremes early on and never became as friendly toward Washington during the 1970s as policy necessities would have dictated; and declared ideology to be an important constituent of several important policy departures, including the Taiwan Straits crisis of 1958, the isolationism of the Cultural Bevolution, and the attempt to overthrown several African governments during the early 1960s. Ideological blinders also caused Mao to badly misjudge other states foreign policies and domestic developments. Thus, Mao once figured that Japan, South Korea, and the United States were planning an attack on China, despite total lack of factual substantiation, while during the civil rights crisis of the mid-1960s Mao pronounced that the Watts riots showed that blacks and workers had united against their white capitalist masters, against completely against the facts.[14]

These three domestic determinants of Chinese foreign policy--the primacy of politics, weight of the past, and ideology--when combined explained much, and often most, of the direction, timing, and specifics of foreign policies under Mao. It provided, moreover, a reasonably sure test and a useful shortcut to understanding Beijing's international orientation. If one could first understand what the Party was attempting at home, many aspects of foreign relations would become clear and the analyst would possess a sure instrument for understanding what was at time completely rational, but on other occasions, rather bizarre, international behavior.

Still, other causitive elements remained outside this framework, for China existed as a nation in an international system, was constrained to obey the "laws" of foreign policy behavior common to all nation-states, and was inordinately influenced by the power and policies of the two superpowers. Of these, perhaps the most influential was the combination of power and interest of the United States and the Soviet Union, which dominated the post-War system and configured, both in their bilateral relations and within the strategic triangle (China being the third member) an important portion of Beijing's orientation to the external world. Thus, when the American-Soviet Cold War was at its height and China was comparatively weak, Mao had to incline steeply toward Moscow. When Moscow threatened China's territorial security, as in the

1968-1978 decade, an even weaker China--in relative terms--had no choice but to make its peace with Washington and add its power to that of the Americans against Moscow. And when America and Russia were, in Chinese eyes, "contending" among themselves--as in the Cuban missile crisis, the several Berlin crises proceeding that, and in Vietnam--Beijing felt it had the necessary maneuvering room to escape, if only for the while, from the American-Russian grip.[15] China's first forays into the Third World (after 1960 and before the Cultural Revolution) followed, as did the plague-on-both-your-houses isolationist policy of the early Cultural Revolution years itself.[16]

So long as Chinese policy focussed primarily on the United States and the Soviet Union, most other aspects of Beijing's foreign relations tended to follow. In fact, one could derive, nearly on a one-to-one basis, Chinese policy toward states outside the triangle, international institutions, global issues, and revolutionary movements once it was apparent where China stood at any given moment on the spectrum of extreme pro-Sovietism, rejection of both superpowers, balance between them, and reasonably warm relations with the United States. Thus, China supported the Thai Communist Party when America was the named enemy before and during the Vietnam War but buttressed the Thai govermment and dropped its bankrolling and training of the Thai communists once Vietnam, allied with Moscow, became the opponent and Washington was made China's superpower protector; NATO was in the enemy "camp" during the heyday of the Sino-Soviet alliance and into the 1960 era of joint anti-Sovietism and anti-Americanism but was treated in a totally opposite manner once the Russians threatened China and the Americans played the role of protector; the post-Selassie Ethiopian communist rulers were initially treated with friendship since they had overthrown an American ally, while their pro-

American Somali allies were regarded disdainfully as a bunch of corrupt generals--but when Mengestu signed up with the Kremlin and the Soviet Union became a threat to China, Beijing declared its disinterest in Ethiopia and quickly restored relations with Djibouti.[17] The list was easily, and nearly infinitely, expandable into all areas of China's foreign relations and provided a convenience shortcut to figuring out--even without detailed knowledge of the local situation--China's foreign policy in diverse arenas.

In addition, China was constrained to conduct its foreign relations in manners that were not entirely within the confines of, or derivable from, the strategic triangle, for like all other entities on the planet, China was a member of the international system and, like all other Asian states, was a constitutent of the Asian regional system. As such, Beijing had to conform itself to the structure and processes of those systems. Thus, if nuclear weapons were the key to national security and international prestige, China was constrained to acquire them. The decision to do so was made early in the 1950s and--after an early go-around with the Russians on nuclear weapons assistance--by the early 1960s an initial capacity was in hand. Indeed, for a time, an extraordinary percentage of China's gross national product and of its heavy industry and technology were given over to this sphere, while China's relations not only with the superpowers but also with many of its Asian neighbors were markedly affected by its heightening stockpile and its increasingly sophisticated missile delivery capability.[18] Thus also, the international system greatly altered its shape after World War II through the diffusion of power laterally across the globe at first and then more toward the "South." China had to alter its approach accordingly. Although it could afford to pay little attention to Europe and Japan for two decades after 1949, Beijing was constrained to focus on Washington and Moscow and took the opportunity of massive de-colonization during the 1960s to try to escape from the strict confines of the strategic triangle. And if the "South" (however designated--the Group of 77 or the Neutral and Non-Aligned Nations or the Newly Emerging Countries) tended to caucus and vote together in the United Nations but excluded Beijing as not unaligned, China would have to grin and bear it until such time as it could prove its Third World credentials and give substance to its declaration that it too was really a Third World state and that it was their natural leader against further superpower dominance.[19]

In Asia, China had to face the fact that the region had become a place dominated not by the militarily strong communist states, such as North Korea amd Vietnam, but by the economically dynamic export-oriented capitalist countries of the "Gang of Four"--South Korea, Taiwan, Hong Kong, and Singapore--together with Japan and the United States. China had fallen even farther behind, as a result of socialist economic policies and Maoist political dominance, than it had been when the Party first came to power.[20] Moreover, in each of the Asian sub-regions, a balance of power was in place in which China played only a relatively small role and where either the United States or the Soviet Union was the security guarantor through alliance with the major regional powers--Japan, Vietnam, and India--none of whom were overly friendly to Beijing. By 1976, although China was geographically in Asia, it was hardly a part of Asia. Asia was led by those at its periphery, while China, literally its center, had excluded itself. But whatever the details, China became a member of the Asian regional system and had to conform to the structure and the "rules" of that system, which generally were made by others.[21]

The final determinant of Chinese foreign policy stemmed from the interaction of Chinese domestically-generated national power with the structure of national interests the product of the country's international interactions. In 1949, merely by reunifying itself under a strong government, China restored much of the power it had denied itself since the nineteenth century. It went on, during the next quarter century of Maoist rule, to invest in the sinews of military and ecomomic power as well as ally itself directly with one of the superpowers and later, albeit in a tacit manner, with the other. These additions to state power, subtracted from to be sure by the major steps backward of the Great Leap Forward and the Cultural Revolution, allowed Beijing to become a major force in Asia and within the strategic triangle.[22]

The normal and inevitable consequence of such a rapid growth in power was a corresponding increase in the range of Party and state interests, such that Beijing found it using that new power to involve itself in situations and disputes at places ever-farther from China's national boundaries. Thus, the country became militarily involved on the territority of all of its neighbors--for the first time in Chinese history. It participated actively in the diplomacy of Asia, the Middle East and Africa, and the strategic triangle. It moved to the center of the international communist movement and then struggled with Moscow for control over it. It traded with, and sent foreign aid to, distant nations. It attempted, for a while, to exert cultural control over Chinese communities in Asia and elsewhere. In short, it used its new power to pursue the expanded list of national and Party goals which that power permitted. As such, China was acting no differently than any other state in history that, upon significant power augmentation, discovered new interests and loci wherein to apply that power.[23]

As China, obeying this Iron Law of International Relations[24] linking interest to power, thus expanded its foreign policy horizons, Beijing's international enviromment reacted correspondingly. In a word, changes were made in Asia and elsewhere that, while accommodating to a much more activist and interventionist China, set up barriers to unacceptable modifications in Beijing's favor. Mostly these were carried out first by the United States--fighting the Korean War, establishing an anti-China treaty system in Asia, justifying the entire containment system partly on anti-Chinese grounds, and entering both Vietnam comflicts partly for reasons of keeping alleged Chinese expansionism within bounds. Later it was done by the Soviet Union--breaking off close economic, military, and ideological relations with Beijing during the later 1950s and early 1960s, then competing for the favor of communist parties and non-aligned states across the globe, girding for war after 1969 with China through massive force buildup along the Sino-Soviet frontier, and finally attempting to establish an anti-Chinese alliance system of its own. Moreover, secular changes in China's Asian environment stemming from the rapid growth of the export-oriented market economies, together with the rising military power of many Asian states (ranging from India through Southeast Asia to the two Koreas) all summed to create additional obstacles to untoward Chinese interference. Thus, with sufficient time, international political leadership, and a plentitude of resources, a balance of power was established in Asia and beyond that kept Chinese power and policy within acceptable limits.

II. Foreign Policy Changes Under Deng

This was the situation up to the end of the Maoist era. During the Deng decade, most of these six determinants remained more or less in place, so that it was still possible to analyze Chinese foreign policy as their joint product. However, in every instance, modifications were made and new trends established such that significantly different conclusions emerged. By the mid-1980s, in fact, it was clear that a new era had opened, that its duration could be at least as lengthy as the three and a half decades of Maoist rule, and that--trends and forces continuing more or less in well-established directions--the upshot could be transformation both of Chinese policy and Beijing's international environment. Let us consider what those modifications were.

In domestic politics, the most important and obvious change was the replacement of left Maoist radicalism by Dengist pragmatic moderation and the corresponding shift from the primacy of politics to that of economics. Whatever appeared good for China's economic development became Beijing's policy, and since the path to material betterment was judged to lie via de-collectivization, return of the profit incentive, price as well as plan as allocative mechanism, and access to markets, technology, and goods wherever they might be found, China rapidly turned into a mixed economy.[25] Internationally, this meant a policy of opening the door to foreign economic investment, technology transfer, and trade. It followed that Beijing's foreign policy became one of peace and security, since such an atmosphere would be most conducive to rapid growth and modernization while their opposites, war and threat, would destroy the Party's last and best chance to catch up with the developed world. And the best way to that end, in a situation of American-Japanese-European economic-technological leadership and Soviet military threat, was to do what was necessary to gain access to the markets, goods, training, and know-how which only the West could offer and to take out security insurance in Washington against Soviet military threats. These became the twin cornerstones of China's new foreign policy.[26]

Deng Xiaoping also went about the business of deradicalizing Chinese politics by gradually retiring the revolutionary generation, ousting the Maoist radicals, bringing into the leadership those with higher education and technical qualifications, and easing out the Cultural Revolution entrants whose only hallmark was Maoist phraseology. He also attempted to install the next two generations of successors, composed of like-thinking people who would--to the extent possible--guarantee continuity of his counter-revolution for another decade or two. Finally, he moved so fast in instituting his reforms and demonstrating their benefits to large percentages of the population that he was able to proceed quite far in building up a support base of technocrats within the Party and beneficiaries (including most peasants and increasing numbers of urban dwellers) among the people as a whole. This managed, at least during his term in office, at least to hold at bay the leftover radicals (and others who remained either unconvinced of the veracity of the new course or who had been injured by its effects]. This, he hoped, would suffice to stem the anti-pragmatic reaction that was sure to come after his departure.[27]

The weight of the past, a heavy influence during the Maoist period, continued in importance but evaluation changed. Because Mao's proclivities had come under a cloud, stress on revolutionary tradition was dampened considerably. The pre-1949 period of formative Party history became almost pre-history. Anti-Westernism, the product of the reaction to 19th-20th century imperialism, was de-emphasized, relaced by underlining China's own responsibility for its late start on modernization. Perhaps most importantly, China went through a period of rapid re-traditionalization. Customs, habits, and practices that had been suppressed under Mao--particularily during the Cultural Revolution--made a strong comeback, under the rubric of modermization to be sure. China thus began to look and act like it had, say, in the 1930s--variagated, lively, differentiated, a bewildering mixture of the traditional, the transitional, and the modern. The Party, in a word, attempted to come to terms with the entirety of China's past so as to continue in popular favor and to utilize the massive energies (and sometimes efficiencies) of traditional practices for purposes of modernization. Nowhere was that trend more apparent than in the agricultural sphere, where de-collectivization led not only to a massive upsurge in production but also to restoration of traditional modes of social organization.[28]

Of equal importance to these changes was the Party's decision to revise how it viewed its Marxist-Leninist ideological heritage. It had long been clear that the Party possessed only a truncated understanding of Marxism and had been attracted to it chiefly because of its anti-imperialist content and the anti-Westernism of the Russian Revolution. The ideational-conceptual base remained mostly a mystery; very few Party members could, for instance, tell the difference between a force and a relation of production or essay on the relationship between economic base and political-social superstructure. Under Deng, the view of Marxism changed. Marx's legacy as a whole was studied, to be sure, but its pragmatic-"scientific" sector was emphasized ("seek truth from facts"), Maoism was criticised and no longer widely studied (where once Mao's writing's dominated bookstores, now one had to hunt for a set of his writings, which in any case stood alongside those of Chou Enlai, Lui Xiaochi, and Deng Xiaoping), and Marxism was downgraded to only one--albeit still allegedly the most important--ideological determinant of modern thought ("Marxism cannot resolve all of our problems").[29] On the other hand, Leninism--as a philosophy of Party organization and modern-day Machiavellianism--was retained as the Party's lietmotif. Even it suffered in practice, however, in terms of internal Party organization (ideological criteria for membership were relaxed, contested elections held at lower levels, decisionmaking on many important subjects shifted to governmental ministries, the raw capacity of the Party to affect everyday life and carry out campaigns declined, and the pragmatic aspects of Leninism supplanted the dogmatic.) These allowed the Party to justify strong relations with capitalist states, foreign investment and even ownership of enterprises within China, and a host of economic, administrative, and legal changes that made it easier to do business with China and to penetrate the Chinese polity and economy.[30]

These domestic changes were crucial, obviously, in propelling China onto an entirely new international course. But international determinants of Beijing's foreign policy also changed during the Deng decade and thus helped as well to configure the country's new direction. The change in China's position within the strategic triangle was the first of these. Perhaps most importantly, Beijing downgraded the Soviet threat after 1978, even though the objective facts of the Sino-Soviet military balance had not changed at all in China's favor--if anything, the Russians were more powerful, absolutely and relatively, than ever before. But by adding an evaluation of Soviet intentions (why, when Moscow had had every opportunity for over a decade to deal a decisive blow to China, had it not done so?) to the traditional assessment of Soviet capabilities, the Chinese leadership concluded that prospects for conflict with the Kremlin were significantly less than previous estimated had stated.[31]

Implications and policy changes followed immmediately. First, dependence on the United States could be lessened. A gradual political distancing from the United States was therefore put into effect, even while many of the details of Sino-American relations--trade, investment, tourism, training, etc.--were constantly thickening the overall relationship and even though security ties were allowed to move from their Maoist-era tacit basis to the explicit level of delegation exchanges, staff talks, military production center tours, direct cooperation in some areas against the Kremlin, parallel policies in several countries, amd transfer and/or sale to China of military or dual-use techmology and equipment. Beijing's relations with Washington hence became both complex and contradictory. On the one hand, China spoke and voted against America in the United Nations, inveighed against the United States as similar to the Soviet Union on grounds that both were superpowers, and called at least one crisis in bilateral relations over Taiwan. On the other hand, China realized that America held the key, in terms of trade, technology, and training, to the success of the Four Modernizations and that it was therefore imperative to maintain good relations with the White House. Indeed, the same went for Washington's friends and allies in Asia and Europe, all of whom could supply China with more of the same kinds of assets. Thus, 20,000 students per year were enrolled at American univesities; trade shot up to between $5 and $10 billion per annum; techmology delegations on both sides traversed the Pacific in such numbers that both capitals stopped counting; American investment in China, although still in its initial stages, soon surpassed the $1 billion mark; and tourism flourished, with several hundred thousand Americans travelling to China every year. Economic benefits thus placed rather severe limits on how far China could go in separating itself in policy terms from the United States. Beijing constantly tested those limits, talking the line of independence, but its actions propelled it in the direction of interdependence.[32]

A second implication was a gradual turn toward Moscow, at least to test the waters of Sino-Soviet detente, if not actual rapprochement. As in the American case, rhetoric and reality stood mutually opposed. On the one hand, Beijing lumped the Kremlin with the White House as a superpower baddie, inveighed against the Russian Polar Bear as a military threat, and refused to admit the possibility of any lasting improvement in Sino-Soviet relations unless Moscow would give way on the so-called three obstacles (Vietnam, Afghanistan, and the Soviet border regions military buildup). Moscow was, of course, not about to retreat on any of the latter, since to do so would exclude the Russians from Asia; and since Beijing knew there was no possibility of that, its rhetoric was not to be taken completely seriously. In fact, just as in the American case, China went about improving practical relations with Moscow at the same time as it blasted the Russians verbally. Thus, trade expanded from near zero to about $1 billion per annum, technological transfer (albeit on an initially small scale) resumed, students and researchers moved back and forth, and various government delegations appeared in the other's capital city. While not as fulsome by any means as the relationship with the United States, this movement at the margin counted, for such changes constituted the stuff of Chinese foreign policy and pointed the way to the future.[33]

On the twin basis of "relative equidistance" between Washington and Moscow (although with a perceptible leaning to the American side), then, along with loud cries against alleged superpower attempts at world domination, China constructed a "new" policy of "independence".[34] Such a policy was, of course, neither new--since it had been tried in the 1961-1966 period--nor independent--since China could not escape the strategic triangle and was moving, if anything, toward interdependence. Nonetheless, a rough balance between Washington and Moscow provided a solid enough basis for the other major variation in China's foreign policy under Deng: a definitive turn toward the Third World. This was, to be sure, a continuation of the Maoist policy and, as before, had solid Leninist and anti-Western roots. The differences this time were two. First, the Third World had taken definite shape, substance, and organization (the Group of 77, the Neutral amd Non-Aligned Nations Movement, OPEC, etc.). And, second, Beijing's leadership potential was lower than previously. In the first instance, the self-appointed Third World leaders either rejected Chinese overtures to join them (despite Beijing's possession of some of the objective qualifications), fearing Chinese overlordship, or were persuaded by Moscow to keep the Chinese away.[35] In the second, China's own policies had sufficiently alienated enough Third World states (Angola, Ethiopia, Cuba, India, Syria, to name a few) by cooperating with their regional opponents or fostering domestic opposition groups as to cause them to wish Beijing to keep out of their respective neighborhoods.[36]

Despite these shortcomings, China's Third World policy appeared to be reasonably well established under Deng and would probably continue as a cornerstone of its foreign policy. After all, Beijing could convince itself that the "masses" of the downtrodden nations held the key to the future of the international system and that China would sooner or later be accepted as their natural leader. Moreover, the Third World was still the locus classicus of the application of people's war, which remained a viable, although considerably shrunken, aspect of overall policy. Further, developing countries were also economic entities, places where China could market its goods or where the tool of foreign economic (and military) assistance could be used to purchase influence. Besides that, the United Nations and many other international organizations were dominated by Third World voting majorities; if China wished to make headway in those assemblies, it would have to learn how to deal with the Indias and the Yugoslavias of the world, on their terms, not China's. Finally, if Beijing were ever to put substance behind its anti-superpower rhetoric, it would have to find some means to add the emrging power potential of those nations to its own in order to confront Washington and Moscow with an opponent that could not be set aside lightly.

The second international determinant of Chinese policy, the international system and its regional Asian component, also exerted a changing influence, since new elements rose to prominence. Perhaps the most important was the enormous changes imposed by the explosion of international trade, the mutual interpenetration of domestic economies, the three post-1974 oil crises, the dollar recycling phemomemon, and the tremendous increase in global debt.[37] In a word, excluding the generally autarchic Soviet-oriented centrally planned economies, the world had become economically interdependent. Any developing nation would have to order its economy according to the rules already laid down by that mutually dependent system. Moreover, the engines of production, invention, finance, and technology were more or less concentrated in the three Western centers: Europe, North America, and Japan. If China wanted what they had to offer, it would have to buy from them and, largely, on their terms. This meant, of course, that Beijing would have to sell to them in equal amounts (failing a reversal of the long-standing policy not to take on a massive international debt load) and that in turn implied that China would have to become a major earner of hard currency through exports. In sum, the country would have to become interdependent if it wanted to modernize.[38]

Another global shift was in the military sphere. A second revolution in weaponry occured on the heels of the nuclear-missile overturn of the pre-1945 order. If strategic weaponry had brought into being weapons of infinite accuracy, almost no flight time at long distances, and total destructive power, now conventional weapons experienced many of the same kinds of changes. Precision-guided munitions meant that it was now possible to assure destruction in a single shot. High technology radars, television, and other electronic equipment enabled pilots and ship captains to destroy targets without even visually sighting them. Satellite technology and electronic listening devices enabled the well-equipped national command authority to know precisely what the enemy had and where it was located. Conventional (including chemical and biological) explosives so increased their destructive power that they began to approach nuclear levels in lethality. These and many other changes in the nature of warfare--including the enormous speeding up of the pace of conflict and the rapidity of destruction--meant that only those with the proper technological base could hope to win wars or successfully deter conflict with opponents so armed.[39]

This new revolution threw China into a military dilemma. Beijing wisely chose, under Deng, to place military modernization last among the Four Modernizations, reasoning that the industrial-scientific-technological-training base must be built up first, lest the attempt to field a military (in all three services, it should be noted) equipped with such weapons might bankrupt the nation. Portions of available military production were even converted to non-military purposes so as to speed up the construction of the broad base of high technology industry. But so long as the country lacked the funds from outside to purchase the new equipment in the requisite (e.g., massive) amounts, and the decision weresustained to continue in a self-reliant mode, it would take an inordinate time to lay down that base, design and produce the proper weaponry, field them in the required numbers, and re-train the military in their use. That would in itself require several decades during which the Soviet threat would necessarily remain unanswered and the need continue to depend on American martial assistance and good will.[40]

As if that were not enough, it was likely that, when the process were completed, the Soviets and the Americans would have moved ahead to at least the next generation--and perhaps the next two or three--of weaponry, thus obsoleting the new Chinese equipment even before it was in place. Indeed, China's security very much depended, among many other factors and unknowns, on whether the American-Soviet arms competition were speeding up or slowing down--that is, whether the curves of weapons development sloped upwards at increasing angles or evidenced a tendency to flatten out with time--and on whether China could "leapfrog" stages in weapons development, thus asymtopically approaching the levels of the superpowers, perhaps after 20 to 30 years. The history of post-World War II technologically-determined weapons changes nay have been too short to make a judgment, but the evidence for the first four decades appeared to support the conclusion that it was the infinity curve and not the logistics curve that dominated.[41] If so, what was bad for China under Mao could not be fixed by Deng and not even by his successors.

The final post-Mao determinant of Chinese foreign policy, the relation between interest and power, with changes in the latter as the driving element, became even clearer in operation under Deng than during Mao's rule. A useful way to analyze these changes after 1976 is to inspect variations in the four means of national power ano how China's interests varied accordingly. The first of these was diplomacy--defined not just as negotiating capability but also as steersmanship of the ship of state through the difficult waters of international relations. Included in that definition is the capability of the nation's leaders to make efficient use of national resources and plan wisely for the future.[42]

The Dengist leadership did exceedingly well in all these departments. It stayed out of war (with the perhaps significant exception of the unwise Vietnam incursion, which, it could be argued, was forced on Beijing by Hanoi's Cambodian invasion). It managed the transition away from Maoist modes of rule to a much more modern and solid base. It entirely revamped the economy. It kept the Americans as residual security guarantors while at the same time not knuckling under to Washington, and extracted from the United States and its allies a goodly portion of their technology. It began the process of opening to Moscow, thus re-capturing its independence within the strategic triangle and re-introducing itself to the Third World. It "learned the ropes" of how the international system worked and made a good start at penetrating to its very center. All in all, China's diplomatic record was not bad under Deng. Accordingly, its national power was augmented to a not inconsiderable degree.

The level and pace of economic development is the second element of national power. It is here that China excelled under Deng. The statistics of the Dengist period are not all in, but already it was clear by the mid-1980s that a breakthrough had been made.[43] As domestic administrative reforms began, one after another, to take hold and as the open door international economic policy began to return dividends, rates of growth accelerated, technology spread, confidence grew (along with popular support for Deng's economic pragmatism), the agricultural problem was largely solved (which, if nothing else, willinscribe Deng in the history books), and large increases in industrial production and consumer goods--the product of a very rapid expansion of capacity--were enjoyed. In foreign economic relations, Beijing's enhanced presence and influence was noticed in many quarters. It became a major trading nation, an importer of technology and an exporter of raw materials and machinery, a force in international economic institutions, and a center of regional commerce.[44] These changes obviously worked their influence on overall Chinese power and made it correspondingly easier for the country to make its way in the world. China's economic interests, accordingly, enlarged. It wanted freer trade, more careful integration among the economic policies of the major states, and liberal flow of technology and its carriers--scientists, specialists, and students. It took an interest in economic developments in heretofore far-away places such as the Middle East and Latin America. It used trade as a device to approach states, such as South Korea, with which it had little or no contact. The same was true of Taiwan. Finally, Beijing continued a foreign aid program that, although hardly fulsome, in terms of available funds and expected political outcomes, still was a useful device to show China's wares and move into new regions.[45]

Cultural policy, backed by relative cultural attractiveness, is the third element of national power. Most states have an ineffectual cultural policy to serve foreign policy goals, but they may nonetheless be culturally influential if, through the media of communications, travel, and trade, they are culturally dynamic and attractive. China under Mao hid its culture under a bushel. Under Deng, it was brought out again, refurbished, and shown around. The result--in terms of tourism, printed and visual media, the performing arts--while still mixed, was a major improvement over the previous era, particularily as concerns peoples. Beijing wished to impress--Overseas Chimese, Taiwanese, Americans, and Europeans--those important for broader policy purposes. The mere fact that the Party permitted such a wholesale restoration of traditional Chinese culture and that it allowed the foreigner to come in to observe served such purposes. The world could enjoy China *qua* China for the first time without having to worry too much about the Marxist-Leninist overlay that had troubled so many. In a generally conservative age in the West, further, some comfort was to be derived from China's renewed emphasis on the traditional and the old, even in the midst of modernist transformation. Finally, many saw hope in the Chinese tendency under Deng to go in--perhaps too quickly and surely superficially--for some of the latest fads and fashions of the West. That was read as a sign that China had at last decided, definitively, to join the world and not to fight it or to isolate itself.[46] It was too early, of course, to decide that, upon listening to Beethoven or putting on jeans and dark glasses, Chinese had finally made the move not merely to emulate the West but to become truly "Western," i.e., modern. But a country with such a mixture of tradition and modernity was much more likely to remain at peace with its neighbors than one--say like North Korea--that refused out of fear all cultural contact with the outside. Culture thus greatly enhanced Chinese national power.

The military is the final element of national power. Under Deng, changes were made that enabled Beijing to field a more potent force, defend the country with greater surety, and at least begin the process of building a modern force that could not only fend off the Bussians but also project Chinese power at ever greater distances from its borders. It was true that military modernization was the last of the Four Modernizations in terms of emphasis; that military budgets stagnated; that the People's Liberation Army had gone under a cloud because of its supposed Cultural Revolution-Lin Piao errors; that its leadership was superannuated and tradition-encrusted; that its ranks were poorly trained and equipped for modern conflict; and that its manpower and production base was allowed to shrink. But it was also true that China's military budget was the world's third largest; that it possessed a large, growing, diverse, dispersed, and rapidly modernizing strategic missile force; that its officer and enlisted corps was younger, more highly trained and educated, and probably more well-led than at any time since the 1950s; that it was ingesting new tactics (under the general rubric of combined arms); that its people's war strategy itself had undergone significant modernization (making its doctrine and training not greatly at variance from other contemporary militaries in Asia and elsewhere); and that it was already receiving a flow of new equipment (ranging from F-7 aircraft to nuclear submarines to sophisticated radars to conventional missiles to new tank weapons, to name a few).[47] With such assets, and with the promise for serial improvements as modernization in other areas more and more began to return dividends to the military directly, it was clear that China was already on the road to signal force augmentation and that the military component ought in time to contribute to a major increase in overall Chimese national power.

Already changes were apparent. Nobody, not even the Russians, thought seriously about initiating war against China. China became, even more than before, a central constitutent in the balances of power in Northeast, Southeast, and South Asia, respectively by deterring North Korean attack against the South, Vietnamese invasion of Thailand, and Indian temptations to strike Pakistan. China thus was a security guarantor of regional peace in Asia. Beijing became an element in the global nuclear equation, with enhanced capacity to strike all of Soviet territority and an initial capability against the United States. Its views were taken seriously at the American-Soviet arms control talks, Beijing becoming a virtual third party at the various Geneva negotiations. Its navy emerged onto the open ocean and into non-Asian waters for the first time since the early Ming and cooperated, however tacitly, with the Americans against the Soviet Far East Fleet. It used some of its spare military production capacity to assist distant states, purchase influence, and earn hard currency. It cooperated with Pakistan in developing the latter's muclear weapons capacity, at least until Washington raised the diplomatic temperature high enough to force cessation.[48] In sum, for a nation that allegedly had military problems of manifold character, in reality China was in reasonable military shape and was rapidly setting the stage for major expansion a decade or so hence.

There was, in fact, a kind of hiatus during the last years of Deng's rule, for with the huge augmentation in Chinese power of all kinds, including the military, by rights (i.e., obedient to the Iron Law of International Relations), Beijing ought to have pursued its already extant interests with greater vigor and "discovered" a whole new list. That would surely come--the most obvious example being a more direct and threatening posture toward Taiwan--, but meanwhile two factors melded together to produce a Chinese foreign policy that, while dynamic and participatory, was also non-threatening and oriented toward maintenance of the status quo. One of these was the need, felt by all in China, whatever their motive, to develop the country as fast as possible. Various groups might differ over the proper means (although a return to strict Maoist voluntarism was quite unlikely), but all agreed that rapid forward movement must be maintained.[49] Since Dengist pragmatism was working so well, few wished to rock the boat. That meant, in turn, most tended to support the opening to the West, which carried so many tangible and immediate benefits. So long, therefore, as the Deng program remained more or less intact, it was improbable that China would revise the priorities of the Four Modernizations and begin, through military adventurism and other evidences of a "hard" line, to make trouble for its neighbors.

The other was the international environment, Asian and global. Particularily in Asia, China had to run fast just to keep up. Most regional states were "on the move"--modernizing even faster in many cases than China and increasing their national power at a correspondingly more rapid pace. Their range of interests expanded accordingly, making it more difficult for Beijing to insert itself into arenas, situations, and disputes in which it had not previously maintained an interest. Japan was perhaps the best example. Shorn of a strong military by defeat, occupation, and constitutional arrangement, it put all of its energies into the ecomomic sphere. By the 1980s, as a result, Tokyo had become an economic superpower and expanded its economic interests everywhere. No country in Asia, save perhaps North Korea, was not greatly affected by the Japanese drive to export, invest, and obtain raw materials. Although China might like to use its new-found economic power to penetrate new regions--say Southeast Asia--, Chinese salesmen and negotiators constantly found that the Japanese had gotten there first and were well established with products against which China could not compete. Price reductions did little good against goods of the highest quality and the most advanced technology.[50] Even at the low end of the scale, China found the going rough, for here Taiwan, South Korea, Hong Kong, India, and many other nations were tough competition and were thus just as well situated as was China.

China could involve itself in manners in which it had a comparative advantage, such as the military, despite its assumed weakness. But in order to preserve the military balance in Asia's three regions, it had to stand on the side of the weak, and hence against the strong communist military power or, in South Asia, against the strong non-communist state allied with Moscow. Thus, until China continued its modernization drive for quite a number of years, amassing the requisite comparative, as well as absolute, increments of power, it would find it difficult to penetrate, much less dominate, Asia's three regions. In fact, Asia marched to a somewhat different drummer than China. Its most dynamic nations were much taken up with the more advanced issues of interdependence: tariffs and protectionism, marketing agreements, large-scale joint ventures or wholly-owned plant investments, comparative exchange rates and interest rates, and the like. China was just heginning to enter this arena.

In other regions, much the same obtained, but for somewhat different reasons. Although weak states abounded in the Middle East, Africa, and Latin American, and hence China ought to have been able to have used its new-found power, several factors combined to minimize Chinese influence. Regional issues--Israel versus the Arab countries, the South African question, and terrorism, for example--were often too difficult for Beijing to address or fell entirely outside its experience. The Americans and the Russians between them often took up most of the policy space which outside powers could ccupy. Certain policy instruments, such as culture, were of little use to Chi in such regions. And China still lacked the means--ships, aircraft, bank broadcast facilities, tourists, etc.--, to project its power to decisi ly distant places. Only occasionally did Beijing become a significant fa or, as in the Iran-Iraq war, where China either sold weaponry to both sides o assisted in the transport of North Korean material. (Even in that ins nce, China's motives were as much financial--earning hard currency--as dipl atic--maintenance of the status quo against possible Soviet expansion.

Latter-day augmentation in Chinese power under the Four Moderniza ons program did place China in an excellent position eventually to project ts influence into distant quarters and new situations, as well as to purs its traditional interests with heightened vigor. But its greater concern ch keeping the development momentum high, combined with the rapidly chang g international environment, prevented Beijing from expending an increas g portion of its new power for foreign policy purposes. How long that re ltant hiatus would last was not clear, for most of the six determinants of C nese policy could change during the post-Deng years. If, however, one were extrapolate Deng-era trends down, say, to close to the turn of the cen ry, the gains in power ascribed both to China and its international enviro ent would be truely enormous. A transformation in Asian and global intern ional relations would have occurred. Where the balance would lie was not cl r, but the very fact that the increment to Chinese power would be under that tion's control and not, as in the case of the environment, scattered among ma nations, could argue in favor of a tipping of the balance gradually in Beijing's favor. If that were the case, China would likely turn more tivist and interventionist in its foreign policy. That would particularily b the case as concerned critical capabilities for power projection. One either would have, or would not have, the requisite aircraft, sealift, global-reach nuclear missiles, etc., in the case of military power, or banks, available capital, know-how, and technology, etc., in the case of economic power. By the year 2000, China could have a capability in all these, and other, relevant departments. It would then look for motives to use it.[51]

III. The Outcome: Chinese Foreign Policy in the Mid-1980s

The latter-day configuration of the six determinants of Chinese foreign policy made possible a reasonably succinct exposition of Beijing's role in the three arenas of importance for Deng's group and their successors: the strategic triangle, Asia, and the Third World.

1. The Strategic Triangle

The center of Deng's policy had to be the strategic triangle. Once that was in order, China's role in other sectors would fall into place. By 1986, China's policy of maximizing security and independence within the over-all framework of development was clearly directed to reconfigurating the triangle into a relatively harmonious, equilateral, and less dangerous form. The means thereto was addressing, on their merits, the more important bilateral issues with Washington and Moscow and to take advantage of Soviet and American willingess to play China's game. The major reasons to expect success were, first, the recognition in both Washington and Moscow that their respective domestic orders required increasing attention and that it would take a considerable period to address them;[52] and second, the large increment to Chinese power as noted previously. Accordingly, the White House and the Kremlin would have less room for engaging in confrontational, aggressive tactics toward each other or, in Moscow's case, toward China. Thus, each would wish to maintain (in the American instance) or improve (in the Soviet) their relations with China.

In the case of Sino-Soviet relations, the direction and intensity of the Moscow-Beijing dispute for long had been set by China. For its part, Moscow merely desired settlement of differences. Its policies were therefore designed to enhance that eventuality and, meanwhile, to discipline Beijing for its trassgressions (in Russian eyes) and protect itself from presumably predatory Chinese ambitions. With a superiority in power, the Kremlin's natural short-term policy was to keep Chinese excesses in bounds through threat of force, making alliances around China's periphery, withholding economic benefits, and setting things right through negotiations from positions of strength. But these devices could not assist Moscow's long-run goal until Beijing decided, for its own reasons, to open up to Moscow. That China did not need to do so long as the Americans provided military insurance and supplied the goods and technology required for the modernization drive. However, once Sino-American normalization was in hand, the Taiwan question adjudicated more carefully, and Beijing convinced that the Russians would not attack, Deng found the way clear to move ahead with Moscow. These pieces were in place by later 1982, with the signing of the Sino-American communique on Taiwan in August, after which both sides slowly and carefully (so as not to alarm the Americans and not to appear to be too eager in the ensuing talks) began to move toward detente.

The actual course of negotiations and signals down through late 1987 need not detain us, except to note that tacit and directly cooperative steps were taken by both sides, that both offered concessions (the Soviets on the border question, the Chinese on not insisting on satisfaction over the "Three

Obstacles" before basic improvement in state relations), and that the way was slowed by domestic political conditions in both capitals (in Moscow by the triple succession and the two inter-regnums, 1982-1985, and in Beijing by indecision forced on Deng by perterbations in leadership succession politics).[53] By 1986, however, the results were clear. Trade--always a barometer of inter-communist relations--turned sharply upwards, heading toward the several billion dollar per annum mark by the turn of the decade; delegations, exchange personnel, and Soviet technicians returned (although in nowhere near the numbers characteristic of this aspect of Sino-American relations); agreements were signed in many fields, ranging from factory repair and upgrading to civil aviation to border trade to language training; and negotiations proceeded over the border issue. China even began to give way on the second of the Three Obstacles--Soviet assistance to Vietnam, enabling the latter to fasten its rule over Cambodia, in return for Soviet military facilities in Vietnam.[54] So in the space of four years Chinese-Soviet relations proceeded from moderately bad to reasonably good, a trend that would probably continue after Deng.

This was done at the same time as China, with America's tacit cooperation, distanced itself a bit from Washington politically while at the same time thickened enormously ties with America in trade, technology transfer, exchanges and training, delegation travel, transport, amd tourism. Sino-American relations had become so close as a result of these practical developments that the Deng leadership felt compelled to try to counterbalance it with at least verbal statements that Beijing had not moved entirely into the Washington-led camp. Deng himself came under political pressure, especially after Taiwan was removed (however temporarily) from the American-Chinese agenda, for allowing things to go too far with the Americans. With two-way trade already approaching the $10 billion mark per annum, 20,000 Chinese students in American schools, hundreds of delegations moving back and forth every month, over 5000 American businesspeople representing hundreds of corporations established in Beijing and other Chinese cities, major development of air routes, tourism, and hotel facilities, and budding military ties, relations had gone far indeed--too far, in all probability, to reverse course.[55] So Beijing adopted a mild but general anti-American stance in the United Nations and other international fora, and pulled out the stops, a bit, of its domestic propoganda apparatus. Washington tolerated such verbal thrusts so long as they remained within limits. And if such statements went too far, Beijing was remined of America's displeasure, usually with the desired result.[56] Washington in fact was counting, rightly or wrongly, on modernization, internationalization, and interdependence, all wrought with American help, to meliorate Chinese policy over the longer term.

The upshot of these changes was a strategic triangle of generally reduced tensions, in which China could have reasonably good relations with both the Americans and the Russians, in which neither superpower need worry overly much about the extent or the effects of China's ties with the other, and in which the threat of Sino-Soviet conflict all but disappeared. Together with American and Soviet propensities to devote more resources and policy attention to domestic problems (which mounted steeply in both countries as the 1980s wore on), a "soft landing" among the three became a distinct possibility. It was still quite possible that American-Soviet relations might go critical at some point around the Soviet periphery or in the Third World (the supply of potential confrontation spots included Iran, Afghanistan, Pakistan, Syria, Southern Africa, and Nicaragua, to name a few). But both Washington and Moscow wanted very much to avoid that kind of meeting, preferring instead to engage in summit talks and stepped-up arms talks. The important question in all three capitals was whether tension reduction and conflict management among any two, but particularily between Beijing and Moscow, could be coupled with eschewing the temptation to make trouble for the third. Moscow could, after all, use the incremental forces freed from a troop reduction agreement with China to raise the military temperature in Southwest Asia, the Middle East, or Africa. And Beijing could do the same vis-a-vis Taiwan once the Soviet threat had declined. China's interest, at least during the period of intense devotion to the requisites of economic modernization, was to do what it could to make sure Moscow did not undermine its relations with Washington unduely. In that regard, the Sino-Soviet border talks and the American-Soviet strategic arms talks came to be even more closely linked, in substance as well as timing, and a tacitly cooperative game was played between Washington and Beijing to assure outcomes satisfactory to all three parties.

2. Asia

The trouble for Beijing was that it would lose its leverage within the triangle once relations among the three had settled into the kind of stability that all could count on. Moreover, China's policy in Asia and farther afield was hostage to the shape of the triangle and movement within it. Since Beijing required regional peace and security for success of its modernization program, as well as a non-threatening shape of the strategic triangle, Deng and his colleagues found it mandatory to play a central role (to the extent that Chinese power would permit, of course) in the politics of the three regions of Asia surrounding China. In each region, one state threatened to upset the balance of power and thus had the potential to drag China into a conflict it wished at all costs to avoid. All three of these states--North Korea, Vietnam, and India--happen to be allied with Moscow (North Korea and

Vietnam directly and India less so). That fact, together with the Chinese decision in the mid-1970s to cooperate strategically with the United States against the Soviet Union, tightly linked the politics of the strategic triangle with the situations in Northeast, Southeast, and South Asia. Conversely, any major change in the politics of the triangle *ipso facto* would vitally affect the balance of power in these regions and, with it, China's own position and policy. Finally, war in any of these regions induced by the three named states could in turn greatly distort the shape of the triangle and the entire basis of Chinese foreign policy after Mao. Any conflict in these regions in which China would, perforce, have to participate, would be disasterous to Beijing. Extreme measures would then have to be taken.

China thus was constrained to go about the task of helping to construct a stable security situation in each region. In all of them, this meant cooperating with the United States and its local allies against Moscow and its regional associate. By the early 1980s, a reasonably solid balance had been built. In Northeast Asia, the task reduced to deterring North Korea from attacking the South. Fortunately, that required no major material diversion of resources, since Beijing and Seoul had no diplomatic ties and China was not physically contiguous with that part of the Peninsula. It did mean, however, a gradual distancing from Pyongyang as Kim Il Sung built his war machine to ever-more threatening levels, competing with Moscow for political and economic influence in the North Korean capital, silently establishing a range of practical ties with the South, and tacitly cooperating with the Americans in the diplomatic realm.[57]

China had to be careful in its direct relations with Kim, for the North Korean leader had twice before swung away from Beijing and toward Moscow in his successful post-1950 attempt to win policy independence within the confines of the Moscow-Beijing-Pyongyang triangle. Given the closeness between China and the North (and the Moscow-Pyongyang estrangement) during the 1970s, he had the room to carry out a similar maneuver again. Since Kim's only purpose internationally was to establish conditions enabling him to conquer the South, and since he wished above all to fulfill that dream during his lifetime (now almost at its end), the North Korean buildup could only mean trouble for China. Indeed, the matter became so threatening by the early 1980s that it was possible for the North not merely to initiate conflict on very short notice (less than a day's warning time) but to conduct high intensity war in the South for at least three months without having to call for help (if, indeed, he would then need it: his war plan assumed the South could be conquered within two weeks, presuming the Americans did not use nuclear weapons).[58] Given the extreme volatility of politics in South Korea, which could fracture the base of South Korean military capabilities to resist the Northern onslaught, and the tendency of the United States to become preoccupied with security events elsewhere in the globe, Kim might move at any time.[59] If he did, prospects for Chinese involvement would rise through the roof (since if Kim did not succeed, the Americans and South Koreans would repeat their performance of the early 1950s) and with it the prospect of Sino-American war. Such a war would, of course, wreck the most important component of the economic modernization strategy--peace, trade, technology transfer, and foreign investment in China--and therefore represent a disaster.

So Beijing felt it had no choice but to back away from Pyongyang to the extent that the latter's threat to Seoul grew. Thus, China first put emphasis on the defensive nature of its security treaty with North Korea, later (when the inter-Korean military balance tilted further in Pyongyang's favor) told Kim China would not support invasion of the South, and finally (when the situation became extreme, by 1984, after the Rangoon bombing) notified the North that China would actively oppose a southern expedition.[60] Thereby China became, along with America, a security guarantor of South Korea, a non-communist state. Its actions were instrumental in keeping the peace on the Korean peninsula.

That, of course, percipitated North Korean movement back toward Moscow, of which the Russians were quick to take advantage. It was a classic operation on Kim's part: keep China from abrogating its security treaty with Pyongyang (or, worse, recognizing Seoul diplomatically), get Beijing in turn to recognize Kim's son, Chung Il, as his successor, take from China whatever ecomomic and military assistance he could obtain, and at the same time repair relations with Moscow by restoring the whole range of state-to-state ties (trade, exchanges, economic assistance, and military support) and procuring Soviet assent to the legitimacy of the impending monarchical succession. These tasks were accomplished by 1986, following Kim's first visit to Moscow in 23 years in 1984 and a series of hurried, tense, and sometimes secret meetings between Kim and the Chinese leadership. The Kremlin did succeed in significant movement toward some of its own goals on the Peninsula: overflight rights for spy planes against China and incipient naval base rights at Najin on the North Korean East Coast.. Their payment was a dangerous departure: transfer to Pyongyang of a significant number of MiG-23 aircraft and a range of other modern military equipment hitherto denied Kim. The Soviets also made known that their SS-20 missiles were trained on American airbases in South Korea. The upshot of these several moves was to drive Beijing even further into the arms of the South Koreans (which was just what the latter desired; they responded with a high level of unannounced trade--up to $1 billion per annum--, cooperation in return to China of passengers and equipment brought to Seoul by defecting pilots and boatmen, and an open door for sports teams, newsmen, and travellers).[61]

Although these maneuvers may appear confusing, they represented solid evidence of detailed Chinese participation in the politics of the Korean Peninsula in an effort to maintain the balance of power there. The situation centered around the North Korean military threat to the South. So long as a rough balance existed between the South and Seoul's American backer, on the one hand, and the North and Pyongyang's Soviet supporter, on the other, China did not need to take a direct hand. It could claim to be Kim's good friend, even as Beijing departed farther and farther from the kind of extreme orthodoxy in ideology and ecomomic direction so distressingly apparent in the

Northern capital. That was the situation down to the end of the 1970s. But when the balance began to tilt dangerously toward Pyongyang (for the first time, it should be noted, since the end of the Korean War three decades earlier), Beijing did not hesitate to disassociate itself from Kim, lean ever-farther toward the South, and cooperate with the Americans.

In Southeast Asia, a similar structural situation prevailed since the end of the Vietnam War in 1975. Once Hanoi's troops were in Saigon, the North Vietnamese became hungry for more territory. The immediately fastened their rule on Laos and began to plan how to expand into Cambodia. They were aided considerably by the Kampuchean communists under Pol Pot, who carried out one of history's most imfamous genocides and then unwisely picked a fight with Vietnam over location of the border. For their part, the Chinese parted company politically with Hanoi as soon as the war with the Americans had finished. The reasons were unclear, but apparently were the product of differences over how to deal with the Americans from as far back as the 1950s, differential dealings with the Russians, concern in Beijing over Hanoi's imperial ambitions in Southeast Asia (which would have cut the Chinese out of the one area they might someday want to regard as "theirs"), and charges by Hanoi of political interference in Vietnamese Communist Party affairs.

For its part, Vietnam sought the proverbial powerful but distant protector from potential Chinese aggression and also attempted to arrange the diplomatic and security landscape to maximize the probability of successful conquest of Indo-China. Moscow provided the ideal instrument for both purposes: the Kremlin was willing and able to bankroll the Vietnamese economy as well as supply both the necessary hardware and the security guarantorship against China. The price was high, of course --a naval and air base at Camn Ranh Bay and Da Nang, partial control of the Vietnamese economy, and supervision over the general direction of Hanoi's foreign policy. Vietnam was made to join Comecon. But Ho Chi Minh's successor's also got what they wanted--Kampuchea, Laos, money, arms, and an alliance ("Friendship Treaty") with the Russians--, all of which proved their worth not only in China's so-called Pedagogical War in early 1979 but also in protecting Indo-Chinese territorial integrity from that time forward.[62]

The Vietnamese conquest, the Soviet-Vietnamese alliance, and the American withdrawal from Indo-China upset the balance of power in Southeast Asia, to say the least. China could only react by further changing its regional policy: it had to move strongly against Hanoi, link up with the United States, and stand behind Thailand. As concerns the United States, China elected to speed up the recognition process and give way (however temporarily) on the Taiwan issue. Part of the new range of agreements between Washington and Beijing, albeit unwritten in the formal documents, was American-Chinese policy coordination toward Vietnam including, in particular, American commitment not to recognize Hanoi and joint diplomatic and (later) material support for the Kampuchean opposition forces. Washington would also look the other way during China's military campaign of punishment and retribution against Vietnam. These elements were in place in late 1978, so that the early 1979 thirty-days Chinese incursion into northern Vietnam could take place with reasonable surety against Soviet counter-attack against China through Mongolia or Sinkiang. Sino-American strategic cooperation, the product of the proto-coalition that had formed in 1972 against Moscow, thus successfully withstood its first major operational test.[63]

As concerned Vietnam, the early 1979 push into the mountains adjacent to the Chinese border was a modified success. To be sure, the Chinese army was shown to be grossly ill-prepared and -equipped for modern combat: at least

20,000 casualties were suffered and probably many more; some of the best Chinese units were fought to a standstill by a smaller number of regional Vietnamese reserves; and China could not use its air force and navy, since it had no experience with combined forces warfare and because it feared Soviet-Vietnamese destruction. But Deng and his associates did succeed in convincing Hanoi that no change in the political and military landscape of Southeast Asia could be made without Chinese participation; the Chinese army did inflict large casualties and wreak much destruction upon Vietnam; and Vietnam felt constrained to pull enough regular forces out of Kampuchea over the next several years as to provide the three groups of resistance forces in that country an extended lease on life. One effect of the war was to push Hanoi even further into Moscow's hands. Correspondingly, Beijing solidified its tie with Washington against Moscow for the next few years, and the Kremlin's relationship with Hanoi became one of the "three obstacles" to improvement of Sino-Soviet relations.[64]

At the same time, however, the Chinese leadership noticed that, although the Kremlin threatened war with China as a means of defense of Vietnam, it did mot actually carry out that threat. This caused them to wonder why the Soviets had not attacked during the entire decade after 1969, when the Central Kingdom had been so vulnerable and the Russians so strong and highly motivated. The answer: Russian intentions were defensive at base. Prospects for war could thus be drastically downgraded and China's independence from its too-close security ties with the United States restored. The seeds of the Chinese move within the strategic triangle to a position of rough equidistance, as well as of Sino-Soviet rapproacement, date therefore from the 1979 crisis, although the fruit did not ripen until after Gorbachev's accession to power in 1985.

As for Thailand, it became a security protectorate of the United States (under the 1959 Manila Pact, which survived the demise of SEATO) and China (which declared that a Vietnamese invasion of Thailand would be followed by Chinese invasion of both Vietnam and Laos). Beijing thereafter repaired its ties with Bangkok by ceasing to support the Thai Communist Party, increasing its trade with Thailand, and establishing good diplomatic relations with Bangkok (including several state visits between the two capitals). Moreover, a useful division of labor was worked out between Washington, Beijing, and Bangkok concerning support of the resistance forces in Kampuchea. Washington would supply money, humanitarian assistance, and some arms, Beijing would send more arms, and Bangkok would allow its territority to be used for refugee camps, rear base guerrilla supply and recuperation, and secretion of American and Chinese arms into Kampuchea. Beijing and Washington also agreed to try to bring together the various factions into an anti-Vietnamese united front (although the United States would have nothing to do with the Khmer Rouge and, especially, Pol Pot). The upshot of these moves was to provide for the security of Thailand, keep the Kampuchean resistance at least alive, and put pressure on Vietnam (China timed artillery barrages across the Vietnamese border with the latter's dry-season offensives in Kampuchea; the United States refused all talk of ecomomic assistance to Hanoi and used the MIA issue to deflect Vietnamese overtures for recognition).[65] A new and stable balance of power therefore was established in Southeast Asia, the product of American and Chinese adjustments within the strategic triangle and in the region to Soviet-supported Vietnamese imperial pretentions. The structure was remarkably similar to that of the Korean Peninsula: Moscow was in league with the regional communist hegimony-seeking state; Washington stood behind the threatened non-communist nation; and Beijing swung its support to the side that needed shoring up to assure international stability.

A very similar strategic situation prevailed in South Asia. There, the hegemony-threatening state, India, was not Marxist-Leninist, to be sure, but it did display a security tie with the Soviet Union. The threatened non-communist nation, Pakistan, had (like South Korea and Thailand), long been associated with the United States first as member of a collective defense treaty (CENTO) and then as recipient of American unilateral guarantee against Soviet (but not necessarily Indian) aggression. That commitment was periodically reiterated and, in 1986, substantially strengthened. China also supported Pakistan from 1960 by supplying military hardware and providing an informal security guarantorship against India. Islamabad's security was thus more or less assured, at least so far as West Pakistan was concerned.

As for New Delhi, it first needed to see to its defense against the obvious Chinese threat from the north after 1959 and, subsidiarily, against Pakistan on the west. At first India depended for these purposes on the United States, but when in 1965 Washington washed its hands of South Asian security concerns, New Delhi turned to Moscow. The Kremlin gladly and quickly responded first by mediating the Indo-Pakistan dispute at Tashkent and then, in 1971, by signing a Friendship Treaty (read alliance) directed against China. Moscow followed that up with a steady flow of military hardware assistance, whole production lines of modern military equipment, and high levels of trade and economic assistance. The South Asian security equation was thus reasonably firm: Pakistan was buttressed by the United States and China on the one side, and India was backed by the Soviet Union on the other.[66]

The balance of power was upset in 1979 by the Soviet invasion of Afghanistan. What had been the South Asian buffer state for over a century was transformed into a Soviet satellite. Russian troops appeared on Pakistan's western border. Neither China nor the United States could reverse the Soviet occupation, although the two cooperated, as in Southeast Asia, with a flow of arms, training, and money to the Afghan resistance fighters. Pakistan became the new buffer state, whose security Washington and Beijing sought to maintain. India took fright at the Soviet advance and gradually began to diversify its arms suppliers to West Europe and the United States. It also warmed up, a bit, to China. The latter sought to break through to a solution of the Sino-Indian border issue by offering to return those portions of the Northeast Frontier Agency, which it had seized in 1962, if New Delhi would allow Beijing to retain the Ladakh--much more important to China as the sole Chinese-controlled route between Sinkiang and Tibet. Although the Indians refused the bargain *pro temps*, a partial relaxation between the two did occur, allowing New Delhi to devote increasing attention to the Pakistan problem and to dealing with the Russian advance.[67]

Washington re-entered the arena by extending its security commitment to Pakistan (Soviet incursion would meet with rapid American response), upping its security assistance, increasing trade and economic transfers, and expanding the range and quality of state relations. It then moved to restore good ties with New Delhi through enhanced trade and re-opening the door to military sales. These changes largely restored the status quo in South Asia. As in Southeast Asia, America and China cooperated not only in shoring up Pakistan's security but also in materially opposing the Soviet conquest of Afghanistan. Washington supplied the money, humanitarian and ecomomic assistance, and some weapons, while China provided other weapons.[68]

Afghanistan became the third of the obstacles to improving Sino-Soviet relations, while the United States, for the first time, vowed to prevent further Soviet territorial expansion anywhere and even began to provide itself the means to assure that end.

In all three regions of Asia, therefore, China sought to construct a stable balance of power on the basis of participation in regional security affairs according to its own reading of the politics of the strategic triangle. Since the Soviet Union was (at least into the mid-1980s) the principal threat and since the United States was the only alternative source of military support, China stood with the Americans, and hence with its allies, throughout Asia. A stronger contrast with Beijing's policies of the 1950s and 1960s could not be imagined. While the details of its Asian regional policy depended on the changing local balances of power, which road China took followed more generally from where it stood, in terms of security relations, within the triangle. The need, after Mao, for Western, particularily American, technical transfers, investments, and trade to buttress Deng's economic modernization program merely accentuated the new direction of Chinese foreign policy.

In the mid-1980s, however, stability within the strategic triangle, and hence in China's Asian policy, permitted Beijing to consider, for the first time, greatly reducing tensions with Moscow at the same time as maintaining good relations with Washington. Would that cause changes in Chinese policy in the three regions of Asia? In Northeast Asia, these changes within the triangle could increase pressure on Kim Il Sung to refrain from invading the South, for he could no longer easily play Moscow off against Beijing to his own advantage. Nor, with presumably much reduced Soviet military presence in the region the product of Sino-Soviet agreement, could Kim rely to the same degree as before on Soviet military backing. Indeed, the Kremlin's motivation for paying North Korea in military hardware for anti-Chinese intelligence flights over the Yellow Sea or military port facilities would deline as well. Pyongyang would still possess the capability to begin a war on its own volition, however, and Beijing would probably want to continue to oppose such a North Korean adventure. Thus, so long as the balance of military power on the Korean Peninsula itself remained heavily in the North's favor, China would want to continue the policies noted previously toward North and South Korea.

In the South, with some additional luck (i.e., no massive political outbreak or Soviet-American confrontation on which Kim could seize as his last chance to invade), a smooth transition of power in Seoul to a new government and to democratic form of rule could occur in 1988. That in turn could lead to Chinese (and even Soviet) recognition of the South (even prior American recognition of the North), and eventually to the convening of a six-party international conference on the future of Korea (participants would be the two Koreas, the three members of the strategic triangle, and Japan). Thus, even in 1986 it was possible to envisage a felicitous turn of events in Northeast Asia stemming from reconfiguration of the strategic triangle in conjunction with impending political changes in South Korea. Given that the Kim Il Sung succession would probably occur around the same time and that the South Korean economy had long since decisively outdistanced that of the North, the Peninsular military balance (sans the American, Chinese, and Soviet contributions) would even out and the prospects for a stable peace in Korea would be enhanced.

Much would, of course, depend on the fallout from changes along the American-Soviet leg of the triangle, especially as concerned strategic and theatre nuclear weapons arms reduction. If, for instance, significant reductions in both areas could be agreed on, prospects for stability in Korea and in Northeast Asia in general could be enhanced. China could therefore look forward to worrying less about the threat of lateral escalation into Asia of Soviet-American crises or confrontations elsewhere. On the other hand, arms control failures could well lead to redoubled superpower competition in many regions, including the Korean Peninsula. In an era of more-than-normal Soviet attempts to expand Kremlin influence into new locations, such a development could be threatening, even disasterous, for all, including China. Fortunately, the prospects for that turn of events seemed to be significantly lower that further progress toward American-Soviet arms limitations.

A somewhat similar conclusion could be reached regarding China's position in Southeast Asia. There, intra-triangular stability, improved Sino-Soviet relations, and continued good American-Chinese ties all would add to Vietnamese inhibitions against invading Thailand. Indeed, Hanoi would be motivated even further to improve relations with Washington, since better Soviet-Chinese ties would undoubtedly cause Vietnam to hedge against Soviet-Chinese agreements worked out at its expense. China's main purpose would remain dual: to weaken and eventually destroy Hanoi's grip over Cambodia and to break the Vietnamese-Soviet alliance. A Soviet Union less capable of militarily defending Vietnam (by threatening China along its Russian and Mongolian borders) would be a Soviet Union on which Vietnam could depend correspondingly less for its security against China. Hanoi might therefore be forced into meliorating its differences with Beijing. China, of course, could attempt to drive a hard bargain --advocating removal of the Soviets from Camn Ranh Bay, sundering the Moscow-Hanoi security tie, and withdrawal of Vietnamese troops from Cambodia. But it would be unlikely to achieve all those ambitions and probably would be foolish to try, since in the end that could push Vietnam even further into Soviet hands. Better to adopt a policy of improving ties with Hanoi through trade, offering to cease support from the Kampuchean resistance forces, and, perhaps, a Sino-Vietnanese border regions arms control agreement--all in exchange for abrogation of Hanoi's Moscow connection. That would, of course, in turn require Soviet assent, which meant that Indo-China would have to remain on the Moscow-Beijing agenda of talks to improve their own relations.

On balance, however, improvement in relations between China and the Soviet Union would loosen lines of division between Vietnam and the Soviet Union, on the one side, and Thailand (plus ASEAN) supported by the United States and China, on the other. The upshot could be a general, but not upsetting, restructuring of the balance of power in Southeast Asia. Some political distances would be lessened: Hanoi from Beijing, Washington, and perhaps Bangkok. Others would be elongated: Moscow from Hanoi, and Beijing from Bangkok and Washington. The overall threat to regional peace, however, would be reduced. That would not mean, on the other hand, that China would relax about Southeast Asia. Its ultimate goals of excluding all other extermal powers and of dividing the region against itself so as to maximize Beijing's own influence would not have been fully met. The Americans and the Russians could not but retain a measure of influence in Southeast Asia. But the seeds of eventual Vietnamese-Soviet divorce would have been sown and the groundwork laid for a diplomacy of movement and competition mostly in non-military realms (e.g., economic and political). There, Chinese policy means, and with them Beijing's influence, could only grow as economic-political modernization proceeded apace at home. The long term consequence would be the rise of China to a level of influence in Southeast Asia at least equal to that of the United States and the Soviet Union and therefore a reproduction, in that region, of the structure of the strategic triangle.

In South Asia, changes in Chinese policy were more difficult to analyze, since the most important variable, Pakistan's internal situation, was trending in an unclear direction through the Zia regime's decision to move (once again) toward a more democratic political system. A weakening of the Pakistani socio-political fabric, which could occur as a result, along class or ethnic lines could jeapordize Islamabad's capability to resist Soviet subversion as well as its overall defensability against direct Soviet atttack through Afghanistan. Chinese capabilities to assist Pakistan in such circumstamces, as well as those of the United States, might be impaired, since a nation divided against itself is not only a temptation to Soviet meddling but is much more difficult to defend through rendering the normal kinds of external assistance. On the other hand, Soviet-Chinese detente would generally lessen the motivations of the two communist giants to battle each other indirectly in Afghanistan, and to that extent would meliorate the Soviet threat to Pakistan. Although Moscow-Beijing detente would not necessarily extend to the Afghan question, the very fact that it was one of the "Three Obstacles" indicated that any major improvement in relations would have to address that matter. All things considered, the Russians were likely to have their way in Afghanistan whatever happened in Sino-Soviet relations (that despite Gorbachev's pledge to evacuate Afghanistan eventually), and the only question was whether Beijing could fund part of its continued security protection of Pakistan convincing the Soviets to pay for improved ties with Beijing partially through taking pressure off Islamabad. That would require extensive negotiations, which could involve the United States, at least indirectly, and which certainly would affect the nature and extent of the American program of support for Pakistan.

With regard to India, Sino-Soviet detente (once again, in the context of continued good American-Chinese ties) would cause concern in New Delhi, at least initially, over possible loss of Soviet security guarantorship against Chinese attack. India ought to be driven to seek further diversification in its arms suppliers, to try once again to negotiate a settlement of the Sino-Indian border conflict, and to go easier on Pakistan. If so, the solidity of South Asian security could actually improve upon upgrading Soviet-Chinese ties: India would be more circumspect in its dealings with Moscow, Beijing, and Islamabad, while the United States, finding greater receptivity in New Dehli, would more easily counter Soviet influence there. Already in 1986 it was possible to discern such movement: Indian decision-makers openly stated that they had "outgrown" the Soviet Union in economic and (to a somewhat lesser degree) security relations, they displayed more interest in solving the border problem with China, and they took no direct action against Pakistan despite unrest in border areas between the two countries.

The major potential problem for India-related security issues were in fact neither China nor the Soviet Union but the prospect of a Pakistani nuclear test. If Islamabad were to be able to demonstrate a nuclear capability, India would either have to go ahead and acquire its own bomb (which it would do quickly), move to physically destroy the Pakistani production facilities (which could mean war between the two and possible involvement of all three strategic triangle members), or reconstitute a strong security relationship with Moscow (thus undoing all the restructuring of the South Asian security equation stemming from the Soviet invasion of Afghanistan in 1979). The most likely option was the first, which would transform the South Asian military equation as well as work economic hardships on both India and Pakistan. China's response would need to be minimal. After all, Beijing already possessed a large number of nuclear warheads and sophisticated delivery vehicles and could relatively easily procure and additional increment to balance Indian production and deployment. In addition, an emerging Indian nuclear capability would perhaps help persuade both parties to negotiate more seriously their border differences.

3. The Third World

China's policy further afield--in the Middle East, Africa, Latin America, and the United Nations--was a resultant of its relations with the United States and the Soviet Union as principally worked out in Asia. When China leaned heavily to one side or other within the triangle, as in the 1950s and 1970s, its policies toward all other states and issues were a strict function of its position within that system. When Beijing attempted to escape altogether from the triangle, as during the 1960s, or when it assumed a position roughly equidistant between the superpowers, as in the 1980s, the situation was more difficult to analyze. Then China could sometimes take a position favoring the American side, at other times one that inclined toward the Soviets, and at still other times one that would permit maximum Chinese into the region or issue in question. Since China during the early and middle 1980s spent much of its policy energies adjusting its position toward the center of the Washington-Moscow spectrum, thereby repurchasing its "independence" in foreign policy, what relations with Third World countries China did have was directed to that end. Hence the earlier policy statements of Chinese opposition to both superpowers without distinction, Beijing's claim that it would never become a superpower and carry out imperialist policies, and its declaration that China was the natural ally (read leader) of the "South" against the "North."[69]

But China had little available power capable of being projected to the great distances required for non-Asian Third World influence. Moreover, the United States and the Soviet Union had for long established themselves as the principal external powers in most regions--leaving comparatively little room for China as the latecomer. Even further, the politics of most regions was both complicated and unfamiliar to China. For these reasons, Beijing had difficulty entering new areas and situations and playing the game once it did succeed in getting in the door. Another "rule" of Chinese behavior in these areas was: the farther from central aspects of the strategic triangle, the more likely China could deal with the countries or issues in question on the "merits" (i.e., in terms of such non-superpower related interests as trade, ideology, and expansion of Beijing's influence for its own sake). A final regularity was that the farther away geographically from China's borders a region was, and hence the more likely that China's power projection capability of all kinds would be minimal, the greater propensity for Beijing to utilize policy instruments that could overcome such disadvantages more easily and at not terribly high cost. That meant, once again, trade and ideology, as well as military training and arms transfers, establishment of diplomatic relations, party-to-party ties, state visits, international law, and multilateral institutions rather than alliances, military deployments, and threats.

China had ignored the Third World during the second half of the Cultural Revolution decade ending in 1976 and did not actively ressert itself in those areas until after the Sino-Vietnamese conflict in 1979. By the mid-1980s, however, Beijing had repositioned itself within the strategic triangle and had centered its non-triangular foreign policy on support for domestic economic modernization. It therefore found increasing room for Third World policies not totally dependent on relations with Washington and Moscow. Accordingly, it spent correspondingly greater policy attention and state resources on upgrading its presence in those areas, partly for power expansion purposes per se but mostly in service of the Four Modernizations. A few examples in each area will suffice to illustrate general trends.

An excellent instance was Chinese arms sales to both Iran and Iraq. Those two countries, at war since 1980, desperately needed military equipment to carry out their sides of the conflict. The United States, hitherto Iran's chief supplier, had long since ceased to play that rule, and the Soviet Union, Iraq's supplier, had partly cut off Bagdad. Both countries, moreover, possessed a surfeit of petrodollars. Beijing saw its opportunity for increasing its influence in the Middle East, making a good deal of hard currency in the transaction, and having a say about Middle Eastern politics as well. Accordingly, China worked out a secret arms sales agreement in 1981 for a considerable amount of equipment to be sent to Iraq and followed it up with further sales periodically thereafter. Total cash amounts apparently were in the several billion dollar range. China then turned around and sold additional equipment to Iran (and, reportedly, delivered North Korean equipment for a fee). Once again, hard currency was "earned," which Beijing used to purchase technology and other economic goods from the West. Strategically, through arms sales to both sides Beijing hoped to help set the stage for a negotiated settlement by establishing a balance of power between Iran and Iraq, preventing Iraq from falling to superior Iranian numbers on the battlefield, and keeping Iran sufficiently strong that, after Khomeni, that country would not slip into civil war and become a tempting target for possible Soviet invasion (and thus also American-Soviet confrontation). Thus, China attained a greater degree of influence in the area and made money in the process.[70]

North Africa provided little opportunity for Beijing (except for Egypt, which supplied China copies of later model Soviet military equipment useful in modernization of the People's Liberation Army in exchange for Chinese-manufactured parts for Soviet-supplied aircraft; the deal was godfathered by the United States), and so efforts were concentrated on nations south of the Sahara. However, conditions there were different from those in the Middle East. Countries were much poorer, Soviet influence tended to crowd the Chinese out of important states (Ethiopia, Angola, and Mozambique, to name three), and distance and comparative unfamiliarity with local conditions rendered Chinese policy instruments less effective. Moreover, China had learned during the 1960s that sending arms to Marxist revolutionary groups attempting to overthrow their governments was counterproductive, just as it had discovered that foreign aid was a costly and not very policy-effective way of trying to purchase influence. Additionally, inviting African leaders to visit Beijing, while good prestige diplomacy for the first time or two, rapidly declined in effectiveness if material assistance (which was what African statesmen wanted from China) was not forthcoming. Of that, China had comparatively little. Beijing was reduced, therefore, to spreading what aid it had around too thinly to capture much political loyalty in Africa (although Beijing continued to maintain an excellent reputation for fairness and competence in what assistance it did render).[71]

It also felt it had to support those states (Somalia, for example) which were opposed to Soviet clients in the region (for instance, Ethiopia) and those revolutionary movements (such as UNITA in Angola) which opposed their

Soviet-oriented governments. It tried to climb on the anti-South African bandwagon as well by providing economic and military assistance to the "Front Line" African states, SWAPO in Namibia, and (serreptitiously) the African National Congress in South Africa itself. Since there were so many African states, all "Third World" and all with United Nations votes, China made efforts to appeal to them as another Third World, anti-superpower developing country. This did not carry Beijing very far, however, since much of its Sub-Saharan African actions did stem from the need to oppose the Soviet Union there but not the United States (Washington did not appreciate Chinese-led attacks on its presence and policies in that region, and told Beijing so).[72]

In sum, Chinese influence slowly seeped back into Africa during the 1980s but with little consequence. Chinese policy means were still short of Beijing's pretentions and most of what could be spared for African purposes had to be earmarked for anti-Soviet purposes. Finally, China's African policy was a victim of the country's own economic success at home. Beijing ran increasing trade deficits with the industrial countries, as import of technology and purchases of industrial goods and services abroad far outran the nation's level of exports to those countries. China had to make up that deficit by selling its own industrial products and primary produce to other developing nations, especially those in Africa. Foreign and military aid could not close the gap, of course, nor was it intended to do so; China had to, and did, make a "profit," as it were, in the Third World in order to finance its "losses" in the developed West. The problem was exacerbated in the mid-1980s by China's agricultural success stemming from the family responsibility system. That made China a net exporter of food and also of such cash crops as cotton. African countries needed food but did not want Chinese cotton competing on world narkets with their own. The market price for such crops thus dropped drastically, exacerbating already severe balance of payments problems for such countries as Nigeria. It was therefore difficult for them to become "friends of China" and followers of the Chinese verbal policy that Third World states should stand together against the threats--economic as well as military--of the superpowers.

Once beyond the Middle East and Africa, Chinese capabilities to project its influence declined precipitously. What was left was verbal declaration, for the most part, and a bundle of contradictions, which smmed up Beijing's Latin American policy. On the one hand, China wanted to establish and maintain its Third World credentials, which meant acting in unison with what was supposed to be a united front against the "North," e.g., the capitalist West and the Soviet-dominated socialist East. On the other hand, Latin America was hardly united against America nor were all of that region's states anti-Soviet (witness Cuba and Nicaragua). Further, Taiwan, Beijing's still-active diplomatic nemesis, hung on in Central America with about ten embassies still functioning (some countries recognized both Taipei and Beijing). With the Russians increasingly active in Latin America, China chose at times to break its own own verbal policy of Third World solidarity to side with the United States on some issues (opposition to Soviet-Cuban infiltration), waffle on others (the Falklands, Granada, and Nicaragua), and stand squarely with Latin American states on still others (Latin American nuclear-free zone, and law of the sea). China did carry on an increasing volume of trade with Latin American nations and was especially interested in Brazil, which had industrial goods and technology for sale at low prices, as well as Argentina. Two-way trade with those countries thus increased from $410 million in 1979 to $1.48 billion in 1983. Beijing also rendered a bit of economic assistance, for instance to Nicaragua (c. $19 million in 1986), but in general replaced aid with trade as its principal policy means in the region. And while trade picked up considerably--although at still modest absolute levels--China provided no military assistance to Latin America. While Beijing would no doubt grow as an economic, if not a politico-military, factor in the region, that would take time, probably another decade and a half.[73]

That left the United Nations as the final arena for Chinese Third World policy. Beijing came late to the principal international organization, having been kept out for over two decades by the United States and its own rejectionist attitude during the Cultural Revolution. In 1972, however, China not only gained membership but by the mid-1980s had already associated itself with over 300 other international organizations. The latter included not merely small and specialized groups but such major institutions as the World Bank, the GATT, and the International Atomic Energy Agency. Beijing's goals were the same as with its more general policies: security, development, and influence. Thus, China quickly perked up its ears when it learned that the World Bank and the International Monetary Fund would loan it large sums on easy terms and that the GATT was the gateway to lower tariffs with the industrial world. It therefore changed its mind about these American- and West European-dominated groups and about not taking loans at interest, as it did also concerning access to nuclear power technology if it would only submit to the rules of the IAEA.[74]

In the United Nations itself, after attempting without success to turn the General Assembly into a forum for attacking the Soviet Union in the 1970s and then the Americans as well in the early 1980s, Beijing concentrated on making itself personal grata with the Group of 77 (i.e., the c. 125 Third World nations that caucased together). The problem, however, was that despite China's every effort to convince them of its Third World credentials, the others did not believe that a large communist country could be genuinely Third World in orientation, especially one that had been at war with India (the quintessential developing nation) and that had maintained alliances with the Soviet Union and (in unwritten form) the United States. Thus, China was specifically not asked to join the Group of 77, and Beijing could only try, as best it could, to put a good face on the rebuff. Further, China's own "independent" foreign policy, along with the constant anti-Soviet plank (until the mid-1980s) in its international dealings (to say nothing of its permanent Security Council status), all caused Beijing occasionally to vote with the United States or against Third World states. So China pursued a rather lonely course at the United Nations, although it made much of its Third World status and trumpeted its presumed unity of interests with other developing nations.[75]

Outside the United Nations, China was also differentially successful. It moved to the leadership ranks of some organizations (such as those noted above but also including the Asian Development Bank) where economic development was the main concern. And it joined others (the International Olympic Committee was the most obvious) where prestige and supplanting Taiwan were important. But it was not successful in establishing ties with exclusively Third World organizations such as the Neutral and Non-Aligned Nations Conference and the Non-Aligned Movement (which were dominated, respectively, by India, China's chief rival in the Third World, and by Cuba, Moscow's surrogate there).[76]

In general, Beijing's attitude toward global, transnational, and international organization issues was a strict function of its foreign policy orientation. When China was excluded from the United Nations, Beijing called for its abolution or severe modification. When China gained admittance, it dropped that and used the General Assembly as a platform for opposing the Russians and then the Americans as well. When development became paramout, Beijing placed stress on international ecomomic imstitutions. And when Beijing moved back toward the center of the Wasbington-Moscow spectrum within the strategic triangle, its stress on policy independence extended to the Third World as well. Thus, China's Third World policy in international organizations continued, as it had been in the more distant past, to be of secondary importance, dependent for specific content on the country's domestic course and the changing directions of Beijing's foreign policy.

IV. The Influence of Military Modernization on Chinese Foreign Policy and on Washington-Beijing Relations

Any consideration of China's military modernization program would have to be placed squarely in the context of the complexities of China's domestic and international situation, as described above. No variable operated independently, and in the case of military development the influence of extra-military factors was higher than in most others, given the comparatively low priority accorded to that sphere and the sensitivity of other states to utilization of military means for policy purposes. This said, however, it paid to inspect several litmus paper military-relatied questions, in the context of Chinese foreign policy and of Beijing's relations with the United States.

The first was how transfer of military or dual-use techmology from the United States and elsewhere would affect the pace and direction of Chinese force modernization, its resultant power projection capability, and the general course of Chinese foreign policy. By the close of the Deng era, preliminary answers were reasonably apparent. First, an indeterminant but probably reasonably high proportion of all technology coming to China from the United States and perhaps elsewhere was finding its way, directly or indirectly, into the military sphere.[77] There was no way to measure that flow, since it involved not merely hardware but patents, licences, training (in China and abroad), spin-offs from joint ventures, theft and intelligence operations, and many other conduits. But because so much of the total was contributant to China's general industrial growth and enhanced labor and managerial sophistication, the payoff to strictly military capacity would probably be high, even though in the short run most would have been earmarked for non-military sectors. If one were to consider only direct hardware transfers to the Chinese military, however, it was clear that the volume was low and would probably remain so.[78] The reasons were well-known: lack of hard currency, unwillingness to become dependent on foreign suppliers for equipment in volume, lack of knowledge of up-to-date equipment, inability to use the hardware without prior investment in the proper logistical and manpower base, competing demands for facilities and funds from higher priorities projects elsewhere in the economy, and a calculation that sufficient time was available to produce the equipment in question at home since the Russian threat had been downgraded. This was borne out during the Deng years, when window shopping was done, samples inspected, and sometimes small quantities procured, but no massive orders made, no turnkey plants procured, and no assembly lines purchased from abroad.[79] Know-how and hardware would have to seep into the military sphere from other sectors of the economy and, to a lesser extent, from abroad, rather than flood it directly. Moreover, the Chinese were not unmindful of the debate in the United States over the wisdom of direct military transfers and did not wish to jeapordize the more massive and more important flow of knowledge and material into other sectors. And since the military appeared to go along with the revised priorities,[80] and as China had no enemy other than the Soviet Union against whom (at least until the overall modernization program were considerably more advanced) to use new high-technology military hardware, there was no visible pressure to change those priorities. In sum, even though Chinese force modernization was probably considerably enhanced by foreign, principally American, military technology inputs, the pace was still relaxed, the changes in terms of military potential still relatively small, the role of actual hardware inputs still limited, and the prospects for continuation of the established pattern rather high.

It followed, second, that Chinese power projection capability would not change significantly over the following half-decade or more. Again, several reasons presented themselves. Unless China were pulled into a Korean or a Vietnamese conflict (possibly one over the Pakistan, but less likely due to joint American-Chinese-Indian deterrence of Soviet attack), or unless China decided to break the economic-security arrangement with the United States so essential to Beijing's future and attack Taiwan, no significant targets of opportunity were likely to present themselves before the end of the century. And there was no sign of a anti-Taiwan buildup, no propensity to have another go at Vietnam, and no desire to become involved in another disasterous Korean War. It was true that Korea, Vietnam, and the Soviet Union could initiate conflict in the three Asian regions in question and it was true that Taiwanese independence could trigger Chinese intervention, even if at enormous political, economic, and military cost. But since China's diplomatic position was already strong, partially making up for its lack of a potent projection force and for its disinclination to use violence in most instances, the likelihood of such conflicts was as small as Beijing could make. And since China did not appear to be constructing a force for Asian arena power projection, it was nearly impossible to conceive of one for use at longer distances (except n the nuclear deterrent sense, discussed below). In that instance, however, other instruments of power, particularly the economic, were more serviceable. Finally, the power available to China's putative opponents would remain too g eat, for the rest of the century, for Beijing to be tempted to fill a power va uum. And a switch to a threatening military posture would only serve to draw the Russians and the Americans further into Asia--a counterproductive olicy, since it was Beijing's long-term purpose to gradually push the out--and to frighten Japan enough to go in for full-scale rearmanent. Such development, by itself, would be a disaster to China.

Given this co clusion, the third question--how a meaningful power projection capacit would affect Chinese foreign policy--would answer itself. If such a capabili y were absent, foreign policy proclivities evident under Deng would not be usceptible to variation due to that factor. Perhaps a post-Deng regime, inding itself with no such capacity, would try to reverse course and work ha d to acquire one in as short a time as possible. But it would have to pay very high price at home and abroad. Domestically, the Four Modernization would have to be reversed, with disasterous consequences. Internationally, C ina's repute, so high under Deng, would fall percipituously, an the acceptence Beijing found so broadly in the post-Mao decade would be re laced with suspicion and opposition. In a word, China's overall power woul actually decline as its military power grew. If China's new rulers were ra ional, therefore, they would avoid such perilous changes and adhere to the ourse so successfully pursued under Deng. That way, eventually they co ld build--year by year--a projection force worthy of the name while at the ame time modernize their economy and society (perhaps even their policy), and maximize their international influence.[81]

In the United States and elsewhere, much attention was paid to the specifics of military and military-related technology transfer. Two American Administrstions put themselves through contortions deciding if, when, and how much military technology and hardware to transfer, through patents, licencing, purchase, training, joint ventures, turnkey plants, assembly line setup, or sample; what bureucratic procedures to follow--COCOM, red-light-green light, Commerce versus State versus Defense Departments as authorizing agencies; in what category China belonged (ally, non-allied, friendly but non-allied, etc.); what constituted military or dual-use technology and hardware; how to control Chinese access to American universities, research facilities, laboratories, and production facilities; what the process of techmological diffusion was in China (so that, presumably, it would be "safe" to transfer civilian or non-military technology and forbidden or controlled through policy channels to transfer military technology); and what constituted "offensive" or "defensive" weapons systems.[82] While it was wise to undertake such a debate, if only to demonstrate how broad the category "technology" was and the seamless webb nature of military versus civilian, offensive versus defensive, single versus dual-use, etc., technology, in the end it was decided that, with certain obvious limitations (strategic-nuclear weaponry, for instance), practically anything the Chinese wanted and could pay for could be exported and that the way would be smoothed for Chinese purchasing agents to make their choices and arrange delivery with reasonable speed. The door having been opened, however, the Chinese during Deng's rule did not rush through it to pick up the array of military goods laid out before them, for reasons just indicated. Perhaps Deng's successors would, but such a change would have to come as part of a wholesale reversal of policy--deliberately depending on the outside instead of continuing a posture of general self-reliance. Indeed, if policy were to change after Deng, it would more likely be in the direction of even greater self-reliance than before,[83] thus pushing shut the door once again.

The strategic missile and nuclear weapons areas were, for good reasons, generally regarded as special, and sensitive, cases, which bore separate, and careful, consideration. All kimds of materials--gyroscopes, supercomputers, certain explosion devices, and reactor components, to name a very few--, obvious resources such as enriched uranium, and much of the associated technology--warhead design and critical testing equipment, for instance--, were proscribed from transfer, in whatever manner, to China, as was the training of Chinese students and others in these fields.[84] The presumption was that such prohibition would at least slow the Chinese momentum and thus postpone the emergence or the heightening of a direct nuclear threat from China. At best, it would give the United States a chance to remain ahead sufficiently far such that Beijing would presumably remain deterred from using what capacity it possessed, even if large. It was well that barriers were set up, for Beijing was indeed in the business of acquiring a nuclear force capable of reaching American territority (to say nothing of that of American allies in Asia and American bases near China) and of perfecting that force quantitatively and qualitatively (solid-state boosters, nuclear-driven submarines for sea launch, higher yield warheads and multiple warhead missiles, and much more accurate guidance systems to allow a counter-force strategy).[85] It had also demonstrated that it was no respector of the logic of non-proliferation, both in declaratory policy under MAO and actual assistance to Pakistan under Deng.[86]

But many problems arose in trying to divorce this area from all other aspects of technology transfer. Most importantly, the whole idea of insulation was fallacious, since the construction and deployment of such systems entailed the melding together of a large array of systems and the general talents of a wide variety of trained personnel. One could not compartmentalize the training of a Chinese physicist into nuclear weapon-related and non-nuclear fields, nor could one rest assured that the myrid forms of high technology built into a modern jet transport could not be inspected, learned from, and eventually duplicated if needed by the Chinese. The line between nuclear-strategic and other techologies and systems was, and would remain, artificial, drawn in a constantly shifting manner, and used for variant political purposes.

American insistence on inspection of the actual employment of "dual-use" technologies would not alleviate the problem. Beijing might not permit such a thing (witness the resistence to placing yet-to-be-built Chinese nuclear power generating facilities under international rules otherwise almost universally accepted), nor would the task be possible, given its enormity, even were China to agree. Further, the picture was muddied by the transferral of some types of technology to China in the strategic, if not the nuclear, area. Instances already in hand under Deng were satellite data and hardware for use against Soviet missile attack and computers first used for the 1982 census but capable of making important weapons design and missile decision calculations. It was argued that such transferred technologies were essentially "defensive" and that, on balance, American national security was enhanced, not threatened. The same was given as reason why permissive action link technology to assure the safety of nuclear weapons should be transferred to China, although that did not take place in Deng's time.[87]

One had to understand, moreover, that the vaunted distinction between defensive and offensive weapons systems was a slippery one. What might be judged "defensive" at one level of combat or in one scenario could be "offensive" in another, and vice versa. Military history abounds in such false distinctions. Thus, justifications given for the sale of diesel destroyer engines, certain kinds of artillery tubes, and ground-to-air missiles--to say nothing of advanced avionics packages for F-8 fighter aircraft--as "defensive" were no more than rationalizations.[88] The larger purpose was to establish a solid arms supply relationship with Beijing in the hope that that would buttress and prolong the anti-Soviet stance of the Chinese and become a major element in the unsigned American-Chinese coalition. At the discussion above on the roots and elements of Chinese foreign policy indicated, there were few signs under Deng that such sales and the promise of more would cause Beijing to adopt a stance toward Moscow that was, in any way, at variance with Chinese interests in freeing the country from the grips of the strategic triangle.

V. Future American-Chinese Relations

1. Costs and Benefits

As the Deng era drew to a close, it was time to ask, more pointedly, what were the actual risks and benefits to the United States of Chinese military modernization in the context of an accepted American military policy of tranmsfer to China of many kinds of military systems and association technologies and of reasonably rapid Chinese acquisition of them, either alone or with Western assistance. Certainly it was true that, as China grew in national power, broadly defined, the risks rose that Beijing would act in manners inimical to American interests.

A good example was arms exports. With a history of arms sales already evident under Deng, clearly more would come. China would surely attempt to earn more hard currency in that manner and not limit its sales out of regard for American interests. And, in contrast with Deng's policy, Beijing might use arms sales to upset local power balances and aggrevate regional disputes. American contributions to Chinese military modernization would merely accelerate Chinese capabilities in the arena. The question was how much farther Beijing would be able to proceed with American inputs. While the answer depended, obviously, on the magnitude and the pace of American military and technological assistance, it was noteworthy that China already possessed a large conventional arms manufacturing industry quite capable of supplying large quantities of arms at reasonable prices.[89] It was true that the weapons in question were at the lower end of the scale of sophistication, whereas most buyers preferred more up-to-date systems. But a potential market existed throughout the Third World for China, which would undoubtedly take advantage of it. American sales would probably not suffer unduly, at least at first, since the United States' comparative advantage was in high technology systems. Nonetheless, with time China would become a competitor in sales and a thorn in the American side to the extent that Washington depended on arms sales to influence regional situations in the direction of stability, to project American influence, and to counter the Russians. (Not that the situation in the long run was entirely bleak; a China willing and able to sell an ever-wider range of military equipment and know-how would make life as difficult for Moscow as it would for Washington, perhaps even more so.) Everything depended on the political situation, within China and in the strategic triangle, both of which would in the nature of things remain indeterminate.

On balance, then, a militarily modernizing China could be of use to the United States under certain circumstances. Indeed, so long as Beijing's foreign policy emphasis was more anti-Soviet than anti-American; so long as the Soviet threat continued; so long as China were devoting its energies mostly to internal economic development and social change for the better; so long as China felt it could use several of the available instruments of power (and not, as in the Soviet case, be reduced to the military alone); and so long as China's regional and global environments were not conducive to the rapid penetration of Chinese power (e.g., balances of power existed on both levels that would not easily be upset), a militarily modernizing China would probably not become a "threat" to the United States. The one exception was in the nuclear-strategic realm, but even there it was not clear that Washington could, or should, do anything other than continue its long-standing policy of disallowing direct transfer of whole systems.

As China rose to become a strategic threat to the United States--and it was China's policy to do so, even if gradually--, Washington would surely have to rethink its whole military relationship with Beijing. But when that assessment was completed, in all probability the conclusion would remain that continuation of a moderate (if not massive) military relationship with Beijing would be in America's interest. After all, Washington was already well down the road in its quest for an interdependent relationship with Beijing in as many areas as possible. China had, under Deng, become militarily interdependent with the United States, as demonstrated by joint security guarantorship (however unwritten in the formal sense) of South Korea, Thailand, and Pakistan, and through parallel strategic policies to deter Soviet nuclear threats. But the equation worked both ways: Washington was also partially dependent on Beijing for its own security, globally and in

Asia. Even before Deng, in 1969, Washington deliberately had moved from a 2 1/2 to a 1 1/2 conflict planning and force structuring base under the explicit presumption (among others) that China was no longer a security threat to the United States and its allies.[90] And since then, the entire American defense strategy, from planning to budgets to procurements to training to deployments, depended equally explicitly on the presumption of a China not hostile to Washington nor cooperative with Moscow in security matters. It was true that, after Deng, China probably would grow more competitive with the United States across the spectrum of instruments of national power, that China would discover new interests to pursue as its raw power burgeoned, and that China would in time even threaten American territority with nuclear destruction. American strategic presumptions would thereby progressively be undermined. But that was still better than a China solidly allied with Moscow, a China going it entirely alone in Asia and elsewhere, or a China once more turned inward in a self-destructive mood. Thus, the policy of military cooperation with China was one means among several to help ensure not only a hopefully positive long term outcome in American-Chinese relations but also to cushion the impact of a negative turn in Chinese policy, were it to come.

2. Principles

Thus, the military element, positive and negative, would remain one aspect of a multi-faceted relationship that, with time, would undoubtedly grow and become far more complex even than it was under Deng. It was the intersection of American and Chinese interests and power, on the one hand, with the resultant policies and instruments of power, on the other, that would continue to produce specific policy issues between the two countries. They included such bilateral matters as trade, technology transfer, military sales, student and other exchanges, and official visits, to name a few; policies toward third countries, especially the Soviet Union; and questions concerning the nature and evolution of the international system (nuclear proliferation, reform and use of the United Nations system, global and regional balances of power, economic interdependence versus self-reliance, and other such questions). Given the size and ambitions of both states, any topic in any of these arenas was candidate to become a policy issue between Washington and Beijing. Consideration of a representative sample in the military area, as well as the Taiwan question, are taken up below, albeit in outline form only.

When addressing any question in American-Chinese relations at whatever level of analysis, it would always pay to keep in mind some general considerations as first approximation guidelines to formulation of American policy toward Beijing. These are five. First, both the United States and China would, and should, persist in pursuing their separate, parallel, and coterminal interests, all of which would change in character as their absolute and relative power varied. That complex of interests, and the policies made in their name, would no doubt become more varigated with time. Therefore, clashes as well as agreements would have to be expected. For the United States, it would be best to maximize areas of harmony and agreement and downplay differences, to the extent possible. In the military arena, similar opinions about the Soviet threat would need to be played up, while differences over arms export problems might be de-emphasized, although not forgotten. The time would no doubt come, as it did under Deng, for Washington to be quite firm. American decisionmakers would then have to consider what could not be traded away and what could be sacrificed in favor of another interest. In the military sphere, past examples in the former column included objection to continued Chinese transfer of nuclear technology to Pakistan and prolongation of American military sales to Taiwan, in both of which cases Washington successfully argued its case to Beijing. In the latter column, a military example was the decision to allow Chinese military personnel access in China to American high technology equipment placed there to monitor Soviet missile and nuclear weapons tests, on grounds that the data so gathered was valuable enough to justify possible compromise of the technology involved and exclusive domain over the data obtained.

Second, no double standards should be allowed to play a large role over an extended period in American-Chinese relations unless explicit trade-offs in interests were involved. Washington would probably have to tolerate continued and unnecessary public criticism from Beijing, but should not allow day-to-day differences to proceed to the point where Beijing was always acting as if the basic relationship was at stake. If a tendency toward such one-sided criticism were to become the norm--as did happen at times under Deng--Beijing would have to be notified that Washington would not further tolerate such normally reprehensible behavior. In general, reasonable reciprocity should be the order of the day. An example during the Deng era was the decision to aLlow visiting Chinese military delegations to see many normally closed military sites, military systems, and high-ranking American officials. The Chinese did not reciprocate to a similarly broad extent. That disjunction was noted but accepted pro temps as still meeting the American interest in maintaining an anti-Soviet Chinese military posture. Later, however, when it was clear that China had in mind not joint deterrence of Soviet expansionism but learning--as cheaply as possible--about American military strategy, tactics, and equipment, the argument for more nearly strict reciprocity gained ground. Subsequent delegations and visits were thus exchanged more or less on a one-for-one basis. Much inequity remained, however, especially in terms of comparative exchange of information and technology.

Third, response to changes in Chinese policy--which could be rapid--ought to be appropriate to those changes. Chinese behavior that accorded with American interests ought to be rewarded, and vice versa. Moreover, "rewards" rather than "punishments" should receive emphasis. So long as Beijing configured its military to confront the Russians and the Vietnamese, the United States was wise to assist Chinese military modernization. Were China to build up its forces against Taiwan, on the other hand, or materially slacken its pace of preparations and deployments against the two first-mentioned foes, Washington would probably be best advised to decrease the pace and quality of military-technological-economic assistance to China. The question would be: how quick a reaction to obvious indicators of detrimental policy changes would be appropriate. The answer would, of course, depend on a multitude of factors as outlined earlier. As a general rule, however, probably it would be best to cool off relations slowly but steadily under such circumstances, but let Beijing know what was occuring, and why.

Fourth, certain limits existed, and would always exist, in American-Chinese relations beyond which it was improper for China to proceed. These should be specified carefully in order to prevent misunderstanding. Conversely, areas where China was welcome also ought to be clearly indicated. In the military area, an absolute prohibition ought to exist against theft of military systems and information, as well as against Chinese attempts to convert dual use technology directly into nuclear-strategic weaponry. (Modification of oil exploration explosion devices for use as nuclear warhead triggers would be an excellent example.) The specification of 400 military end-use items approved for export to China was a good instance of providing areas wherein China was welcome. Such limit-defining operations, positive and negative, should be encouraged in the post-Deng era.

Last, it would be well were the United States to seek new departures, i.e., to act creatively in American-Chinese military relations. That would continue momentum and assist in avoiding situations wherein each side felt it would have to make a principalled stand and be unable to retreat or compromise. For instance, as Washington and Beijing come into a posture of mutual nuclear deterrence, it would be wise to engage in arms control talks, defined in the broadest manner. Perhaps agreements would be forthcoming that would alleviate or avoid altogether tensions arising from the actuality of Chinese nuclear weapons targetted against American territority and the gradual restoration of Chinese targets, in response, to the American strategic war plan. Another example might be the joint development of new military technology for deterring Soviet conventional attack, or the deployment to China for testing purposes of non-nuclear American systems just emerging from the research and development stage. In response, China might share with the United States newly perfected tactics for handling a Soviet ground offensive.

3. Some Specific American-Chinese Military Issues

Whether or not the United States adhered to these (or other) principals in dealing with China in the military sphere, policy differences would surely arise. They would be of two sorts: specific issues that could emerge at any time and that could be addressed and presumably solved on their merits; and more general questions that would tend to infuse specific questions with undifferentiated tensions but be capable of being solved by more or less marginal policy changes. Specific issues tend to be short term while general problems stretch over extended period of time. At the end of the Deng era, three specific issues were visible and were candidates for solution. Three others occupied the general issues category and were already causing trouble for American policymakers. One problem --Taiwan--straddled the two categories, being specific but long term.

One specific issue was Chinese nuclear assistance to Pakistan. This had been going on for many years, surreptitiously, and in the 1980s in contravention to repeated Chinese assurances to the United States (in the context of negotiations over transfer to Beijing of American nuclear power technology) that no such shift had occurred or would. By the close of the Deng era, and with the nuclear power question off the agenda of American-Chinese differences, the issue had receded somewhat.[91] It could emerge again, however, once Pakistan made it known that it had obtained such a capability, that India would then acquire its own nuclear weapon, and the non-proliferation barrier decisively broken. Because the entire structure of South Asian security relations would continue to depend on American-Chinese security guarantorship of Pakistan, and because the American component was predicated (among other things) on a non-nuclear Pakistan, an "Islamic bomb" could sunder the Washington-Beijing partnership in South Asia. The issue might in fact be defined more sharply: would Beijing join Washington in putting pressure on Islamabad to remain non-nuclear and would China be willing to take action (such as withholding military supplies to Pakistan and telling the Pakistanis that Chinese security guarantorship depended on that country's continued non-nuclear status)? The issue for Washington thus was whether the Administration would not merely consult with the Chinese about the matter but raise the issue to the highest priority level. The matter could also be seen in the context of maintenance of a strong American-Chinese working relationship in the security realm. It would be better to address and solve the question than let it slip along until events had gotten out of hand.

The other two specific issues, arms sales and reciprocity, were broached earlier. Chinese arms sales would probably become increasingly disturbing to the United States, merely because Beijing would become a strong competitor for available markets as higher technology Chinese goods were produced in exportable quantity and as China's need for hard currency grew. The American program of sale to China of a wide range of military technology itself carried the implication of Chinese entrance into markets previously dominated by Western and Soviet arms. And Chinese competitiveness would no doubt rise, if only because Beijing would be able to provide reasonable products at low prices. The question for policy purposes was whether Beijing could he induced to work in parallel with Washington in critical markets or whether China would attempt to disrupt regional balances either to amass hard currency or to gain influence.

Under Deng, parallel arms sales and transfer programs existed for Egypt, Sudan, and Somalia (the last three also recipients of American military assistance), and to resistance fighters in Afghanistan, Angola, and Kampuchea (these not only in parallel but in fact in cooperation with American military assistance programs). Moreover, China apparently did not send arms to Granada or Nicaragua, probably out of consideration of American policy in Central America, or to Libya in North Africa. The problems, aside from Iran and Iraq, concerned North Korea, the Palestine Liberation Organization, and anti-South African militants. Chinese military assistance to Pyongyang continued into the 1980s, obviously as a means to influence North Korean policy in general and to counter Soviet arms assistance in particular. The upshot, however, was augmentation of North Korean capabilities against the South and hence greater threat to the peace on the Korean Peninsula, as well as North Korean capability to export arms of its own to states and groups opposed to

Washington. China also transferred s stantial military equipment, and provided training for, the PLO, the S thwest African People's Organization, and the African National Conference. he latter two were not enormously disturbing to American policy, especi ly after the turn during 1986 of American policy toward South Africa. he former was, since it showed (like the Iran-Iraq military equipment sale that China would use whatever instruments of policy it could to ins t itself into regional power equations. On the other hand, Beijing realized t t the PLO and other anti-Israeli organizations lacked the capability t alter the Middle Eastern situation decisively, that Israel would remain major regional power, and that China's capability to compete with American a Soviet military assistance programs in the region was strictly limited. Acc dingly, China progressively de-emphasized its relations with such or nizations. And, to its credit, Beijing refused to endorse terrorism as a mea of policy. In strong contrast to Moscow and Pyongyang, little evidence xisted supporting Chinese training or supply of terrorist groups in the Mid e East or elsewhere.[92]

Bejing forgot, however, that its ttempt to insert itself into Persian Gulf affairs would not come without c t. When in 1987 the United States sent a strong naval task force into the Gu , it was faced, among other threats, with Chinese-supplied Silkworm missil in Iranian hands. Beijing unwisely denied selling them to Teheran, altho n the evidence in American hands was incontrovertible. The episode caused any in the American defense establishment to have second thoughts bout the wisdom of such a liberal arms transfer relationship with China. It appeared likely, in fact, that forward movement in that area had ceased and that permanent damage to the overall American-Chinese security relationship had resulted.

In sum, with the exception of the Persian Gulf situation, under Deng China appeared to configure its arms sales, supply, and military training reasonably closely to American policy goals in most regions, despite a spate of strong verbal attacks on Washington for alleged attempts to dominate (along with the Russians) regional balances through its own program of security assistance. But were Chinese power were to grow to where Beijing could decisively assert its autonomy within the strategic triangle and where security assistance would provide an efficient tool to take an independent line in fact as well as declaration, Deng's successors would, like most other states with ambition and power, use this means to project China into regional affairs with increasing regularity and weight. Indeed, the magnitude of China's security assistance program and the degree of its congruence with American policy goals in distant regions would become one of the most important tests of the closeness or separation of the two countries' foreign policies in general. Security assistance would become an additional area where power would drive policy. Augmented Chinese means in this sector could become a factor in driving the two countries progressively apart.

As for reciprocity, to the extent a problem existed during the early Deng years, it was gradually solved later on, as the two countries gained in experience with each other and as American officials realized that the most productive manner to deal with the Chinese was through more or less strict equality. The earlier willingness to countenance closed Chinese facilities in the face of deliberately opened American sites, etc., was replaced by a program on the American side indicating the virtues of reciprocity and on the

Chinese side by a progressive opening of previously off-limit sites. If anything, both sides exhibited a tendency to pay too much attention to matters of form and protocol. The slow-down in development of American-Chinese military ties that took place in the middle 1980s was partly attributable to such excessive caution.[93] A degree of inequality of reciprocity would continue, however, by the very nature of the military relationship. America was, essentially, the provider of goods and services, China the consumer, with payment being rendered partly in tangible assets (money), partly in policy coordination (or, negatively, in a lower level of policy dispute), and partly in respective interests served. Strict reciprocity was, therefore, neither to be expected nor desired; and if ever such a state was attained, further development of military ties would probably cease. Thus, in this area, a high volume of interaction was a sign of health, but so was a measurable degree of inequality. The issue was whether the two sides' decisionmakers would possess the wisdom to perceive that, and then to relax as much as possible, given the very different cultures involved and the propensity of military leaders in general to look on such matters too narrowly.

Long term issues in American-Chinese military relations were also three: differing assumptions as to the character and evolution of such ties; different purposes in mind as to why the relationship was entered into in the first place; and different assessments as to what China would do with the vast military power being amassed through economic modernization. In the first instance, ten years after Mao's demise it had become quite clear--to observers at least--that Washington and Beijing did not share the same assumptions concerning the security tie. American officials presumed that joint planning, deployments, talks, visits, transfers, training, etc., were all done with deterrence of the Soviet Union in mind, in Asia and across the globe. American and Chinese power were to be added together and their policies coordinated over the long run, since the Soviet threat was vast, increasing, pervasive, and continuous. Americans presumed that China, because it was under explicit Russian threat, because it was so weak vis-a-vis Moscow, and because it would take a very long time to escape that threat (which, it was additionally presumed, would not voluntarily subside), would have no choice but to remain strongly anti-Soviet for as far ahead as one could see. Chinese officials, on the other hand, did not appear to perceive matters that way at all. They knew of the Soviet threat, obviously, and were properly cautious about treating it lightly. But they did not believe it would extend into the indefinite future, they believed that the Russians would not attack at all except as a follow-on to a successfully prosecuted Third World War (which was exceedingly unlikely), they knew that Chinese nuclear weapons had already deterred the Soviets and would continue to do so, and (most importantly) they were not adverse to eventual compromise with the Kremlin on basic issues. China was thus using American resources (strategy, anti-Soviet policy, technology, military systems, and hardware) to strengthen China sufficiently to where it could move to improve relations with Moscow through striking a bargain on the level and location of Russian and Chinese forces along their common border. By that means, China would become independent of the United States as well as the Soviet Union and, eventually, escape the confines of the strategic triangle.

The situation had thus changed dramatically since America and China first re-discovered each other in the late 1960s. Then, Beijing needed Washington the more, as the Soviet threat was immediate and undeterrable without American help. By the end of the Deng era, America needed China more, since the Soviet threat to the United States had grown considerably, while China had managed to stave off the Kremlin and improve its own relative power position as well. A classic bargaining situation was thus in the making: Beijing could continually raise the price of the American connection, because American officials seemed oblivious of the different assumptions with which the two capitals entered into the relationship in the first place and apparently had not yet calculated the change in relative power within the strategic triangle. Moreover, China could bargain with Moscow at the same time in a similar manner: "we Chinese will sign an all-encompassing agreement with you Russians, and dampen considerably our ties with those Americans in the process, if only you will conform to a list of conditions"--which although quite costly to the Kremlin also, might be saleable. The future was therefore likely to be full of surprises for the United States. Not only would China become ever more difficult to deal with in terms of increasing demands just to continue what had been the past norm but the likelihood rose that, one morning, Washington would wake up to find the news of a comprehensive Sino-Soviet agreement worked out at America's expense.

The second long term issue followed from the first. The United States entered into a strong working relationship with China not only as an anti-Soviet measure but to effectuate a permanent improvement in ties. America, caught up with the ideal of a modernizing, trading China, took on with missionary zeal the goal of helping to bring that country into a state of permanent friendship, to be effectuated through making Beijing interdependent with Washington. Close security ties would be one element in that program. China, on the other hand, conceived of the situation as one of a necessary but temporary dimunition of certain aspects of its independence--including short-term dependence on the United States for some portions of its national security--but with the goal over the long run of recapturing independence in every department. The means to that end were, for the while, the same as those used by the United States: trade, technology transfer, formal visits, and some military assistance. But the goals were antithetical--interdependence and permanent participation in the international community for the sake of mutual advantage versus independence and temporary participation in the international community for the sake of Chinese interests alone. It followed that American-Chinese military cooperation could prove ephemeral, depending on Chinese evaluation of how far they were down the road toward deterring the Russians through their own means amd making their own way in Asia. The Chinese leadership might be wrong in its evaluation, and the Americans right; that is, the Soviet threat might require extended security cooperation, and the world as a whole might not permit even such a large nation like China the luxury of "independence." Time would obviously tell. But a mindset in Beijing would persist in favor of trying to escape from the American embrace--precisely the opposite of that in Washington, it should be noted--with the consequence that China could not be counted on as a steady "friend" of the United States. The road ahead in American-Chinese security relations would thus be bumpy at the least and might even come to a dead end.

The third long-term issue was what the United States should do once China began to convert a sufficient portion of its newly-obtained economic power into more direct military means. Beijing would seek to project that power into arenas, both geographic and substantive, where the American security (and other) presence had already been well established. A series of confrontations would then have to be expected, with Beijing appearing to take a different and challenging position for no other reason than to make things difficult for Washington. Any of the regional or substantive security issues examined in Part III could become candidates for such standoffs. If enough such instances occurred, a point would be reached wherein American-Chinese relations would become so tension-laden that a crisis would occur. The danger would then be that China would swing over to the "unfriendly" columm and finally be regarded as an "enemy." With the exception of Taiwan, no single issue during the immediate post-Deng period would bring matters to such a pass. The concantenation of several, however, could. (That presumes also that no startling and threatening improvement were to take place in Sino-Soviet relations.)

The question for Washington would be how to recognize, avoid, approach, and deal with the progressive separation of the two countries. Would there be some way to "measure" the situation, to evaluate how much augmented Chinese power, especially military might, would percipitate a fundamental shift in attitudes on both sides? Could the United States help configure China's regional environment in Asia to prepare for such an eventuality? Presuming that the future was problematic at best, would it not be wiser for the United States to try to slow down Chinese modernization by cutting back severely on trade, technology transfer and the like, as well as severing the security tie at an early date? Or should not Washington try to last it out with Beijing by acting as positive and as helpful as possible, thus placing any ensuing "blame" on Chinese shoulders and hoping that the separation, if it were to come, would be less disruptive and possibly even temporary? Should not America use the immediate post-Deng period to try as fully as possible to onvince Beijing's new rulers of the virtues of interdependence and of full nd continuous participation in the international diplomatic and economic ystems? Should not Washington thus redouble efforts to increase trade apidly, educate even more Chinese students, open up American technology even urther (i.e., forget about reciprocity and other niceties), and pull China as uickly as possible into such a high degree of interdependence that Beijing ould never again retreat? Why not demonstrate that China's drive toward independence" would not only prove anachronistic in the modern world but that independence" would turn out to be self-imposed isolation, as dangerous to hina as to its neighbors?

No ready and easy answers exist to these questions. But they would have o be posed. Indeed, the post-Deng stage in American-Chinese relations would enter not only on whether and to what degree to continue the gains made uring the post-Mao decade but how to address these issues and how to prepare or the inevitable transformation stemming from the emergence of China as a rue superpower. In the security sphere, that meant, in all probability, djustment downward of American expectations. China would not purchase the inds or amounts of military equipment previously expected. Beijing would hoose which to continue of the existing range of security arrangements it aintained with the United States in Asia, against the Soviet Union, and in ther arenas. China might be convinced of the need to cooperate in broadened rms control talks, but that would take some work. Beijing would surely try o continue to obtain as much military technology as possible from the United tates, but not at the price of further American-induced anti-Soviet security ooperation.

In sum, Washington would have to address, frontally, what its basic goals were vis-a-vis China and what kind of long-term Asian security equation it would want to construct. If American decisionmakers were to perform those two tasks, they would be well enough prepared for the new and dynamic era of relations with China that Deng's retirement or death would bring forth.

VI. Taiwan

The future status of Taiwan remained the one serious issue separating America and China, for despite three agreements on the matter during the Mao and Deng eras, Washington remained Taipei's security guarantor against Beijing and thus the only obstacle to forcible reunification. The question had not come up again because China had decided, *pro temps*, to put it on the back burner in favor of obtaining large-scale American economic assistance during the modernization drive, because China did not have the force necessary to overcome Nationalist resistance at relatively low cost, and because the Soviet threat required pullback from the Fukien front and redirection of Chinese military attention inward toward Siberia and southward toward Vietnam. If any one or more of these variables were to change, the Taiwan issue could again advance to the center of American-Chinese concerns. Moreover, an additional wild card lay hidden in the deck: the political situation on Taiwan, since World War II a constant, had become a variable during the 1980s as both the government and its opposition in Taipei prepared to move the island toward democracy. If Taiwan were to become a viable, working democracy, a formal declaration of independence might be around the next turn, given that the vast majority of inhabitants were local Taiwanese. Needless to say, a democratic, independence-seeking Taiwan would be even more difficult for the United States to shuck off were the Mainland to launch an attack.

Moreover, the post-1982 quietude between Washington and Beijing over the issue was not to be construed as disinterest on China's part. Rather, China took a calculated decision that since the island could be conquered only at too high a military, economic, and political price, it was best to leave the matter alone until circumstances argued for a more favorable outcome. That assumed, of course, that the course of events would not trend away from Beijing, i.e., that Taiwan independence was highly unlikely politically and that the island would not be defensible militarily. But the emergence of political dynamism in Taipei, coupled with American manipulation even of the August 1982 Communique (so favorable to Washington in the first place[94]), threatened to falsify that assumption. It was likely, therefore, that the post-Deng Chinese leadership would feel constrained to bring the Taiwan question forward once again. That possibility was enhanced by Beijing's propensity to test the waters with the Americans periodically, as it had done so many times before. The most likely time in the later 1980s was during the last months of the Reagan Administration, the interregnum between his and the successor American government, or the early days of the new presidency, i.e., between later 1988 and early 1989.

The situation was thus fraught with danger. In fact, China's posture was subject to change on an additional count: the general character of the post-Deng domestic situation, political and economic. If, for instance, Deng's successor turned out to be more interested in ideological correctness than he, and hence probably more prone to compromise differences with Moscow and to allow the American security connection to wither away, the likelihood would increase of Sino-Soviet compromise on the border security question while the probability of continued strong security ties with Washington would decline. Both would auger poorly for Taiwan's safety. If, further (as seems likely to this observer[95]), the post-Deng leadership were to draw back from his total emphasis on economic pragmatism and re-establish a more nearly Soviet-style economy with priority on heavy industry and the military, the economic connection with America could only decline in relative importance. In that case, Beijing would feel comparatively less inhibited in mounting a direct threat to Taiwan. Thus, the two most important variables in Chinese foreign policy, the political situation at home (including the personality of the new ruler in the Jung-nan Hai) and the configuration of the strategic triangle, under both Mao and Deng favorable to Taiwan's continued autonomous existence, could well become factors supporting a more forward, militant policy toward Taipei.

Such a pessimistic conclusion would have to be modified, however, by the concatenation of factors inhibiting Beijing from taking direct action. China was not militarily prepared for such a venture, lacking the requisite equipment and training, nor at the end of the Deng era could signs be found of initial activities underway. Moreover, both the United States and the Nationalist Chinese were confident they could spot changes quickly were they to be initiated. The American response also appeared reasonably predictable: the Taiwan Relations Act nandated continuation of American intents and capabilities to defend Taiwan, and although the Act was not as strong or as direct as the alliance with Taiwan which it replaced, it did assure (to the extent the Congress was willing) extended security guarantorship of the island, beyond agreements signed later with the Mainland.[96] And there was no indication that Congress was slackening in its interest in Taiwan; indeed, with the process of democratization in Taipei well underway, and with the need felt to serve all American defense commitments, indirect as well as direct (e.g., Israel), motivation was present to keep the commitment to Taiwan. Thus, if China were to move against Taiwan, or even to make the necessary preparations, the Beijing leadership would have to break the entire American connection, from trade to security cooperation. That would be very costly, to say the least.

Further, girding for war and then launching an attack would spell the end to Deng's program of economic modernization, with all the detrimental domestic and international consequence that would follow for China and the Chinese Communist Party's standing among the Chinese people. The longer Deng's system continued in place, and thus the more China reaped the benefits of rapid growth and other consequences of the Open Door policy, the more reluctant Beijing would be to give it all up just for a highly risky attack on Taiwan. Going over to a configuration of militancy would also spell the end to Beijing's foreign policy of peace, which had been so beneficial in terms of international acceptability and support for the modernization program. Proof would be had, for all time, that China was not to be trusted, and all the old attitudes, learned so well during the Maoist era and which Deng had striven so hard to undo, would return with a vengeance. To attack Taiwan would be a policy disaster for China.

Finally, even were an attack to be successful, it would be a high cost operation in terms of men and equipment lost. Whereas there was no doubt that an attack would prove victorious in the sense that the flag of the People's Republic of China would fly over Taipei, China would have to countenance the expenditure of much of its front-line air force (estimates ranged up to 40 per cent), a significant number of ships, and certainly casualties in the hundreds of thousands. Moreover, the Nationalists had laid careful plans for defense, were bending their entire military purchase policy from the United States, and configuring their domestic production activities to throw up a hard shell air and sea defense around the island.[97] The United States also would continue to take care to sell or transfer to Beijing only "defensive" weaponry and technology (although remarks entered earlier concerning the disutility of that distinction bear repeating; the point being that if Washington perceived China using American equipment, training, amd technology to gird for an attack on Taiwan, it would cease such transfers). And at the end of a presumably successful operation, the Mainland would still have to garrison an island thoroughly resentful of the conquest, rule a people prone at every point to rebellion, restore an economy in shambles, and overcome a culture, a life style, and a political tradition (despite all that has been said of the assumed similarity between the Communist and Nationalist parties) strongly at variance with that of the Mainland. From every point of view, therefore, Taiwan would be difficult to swallow.

A "net assessment" of the probability of a change for the worse in Beijing's approach to Taipei was difficult to make. If Deng's successors were "rational", i.e., if they were to make the same cost-benefits analysis as that offered here, a policy of militancy would remain unlikely. Too many things could go wrong and the cost would be too high in any case. (It should also be noted that, if the military operation did fail, the Mainland would forever have lost its chance to take back the island, since upon successful defense Taipei could approach the world as an independent state in every sense of the term). On the other hand, rationality since 1949 was at times (in non-Chinese eyes) in short supply in Beijing, and it would always be possible for a successor Chinese leadership to change its approach, cast caution to the winds, and make a try for the island. Even if that did occur, however, it was highly improbable that a "bolt out of the blue" would take place. Policy changes and military preparations would take place over an extended period, allowing the United States and Taiwan time to act accordingly. It would seem, therefore, that even an "irrational" turn in Chinese policy could be dealt with: sufficient time, resources, and (presumably) will were present to deflect any direct attack.

There was no doubt that Chinese economic modernization, including military modernization, would eventually provide Beijing the means to force the issue if it so chose. It was also clear that, to the extent the United States assisted China in developing itself, and especially to the extent that transfer of military resources took place from American to China, the Mainland would be able to accelerate its capabilities against Taiwan. But it did not follow that Taiwan was the more endangered thereby nor that the United States should slow down or cease its economic and military sales and transfers to China. For one, Washington's central strategy toward China appeared to be a winning one: encourage Beijing to remain on the path of economic modernization as the central element in its domestic and foreign policies, and therefore over time not only demonstrate the virtues of peaceful relations with all countries but actually integrate China into a new structure--in Asia and globally--of interdependence. In the end, Beijing would neither wish nor be capable of conducting a policy of threat and aggression against its neighbors, including Taiwan. For another, the new Asian international order which Washington was helping to construct would eventually be strong enough of its own accord to resist possible Chinese threats. A rapidly modernizing Asia was the best deterrent to coming Chinese attempts to project its new power into new areas. Third, Taiwan itself was accumulating the means to defend its own territority. The Mainland would thus find Taiwan as difficult to conquer during the longer term future as it had down through the Deng era. And the United States would probably continue to assist Taipei in providing that capability. Finally, the very character of Chinese civilization militated against an attempt to destroy a whole portion of the country merely to replace a local political authority. While Beijing's policy of peaceful reunification with Taipei could indeed change at any time, the costs of actually carrying out the conquest would always be too high, in the moral as well as the physical sense. The best Mainland policy was therefore a prolongation of that worked out under Deng: continual offers at reconciliation, construction of "models" (such as Hong Kong) to demonstrate how reunification might work in practice, and improvement of the economic and the political situation in China itself to where Mainland China resumed its practical appeal to Nationalist and Taiwanese alike.

So far as the details of the American programs of military assistance to Beijing and Taipei were concerned, it appeared that, at the levels and directions contemplated, the increment to Beijing's power provided thereby would continue to be marginal to Taiwan's security. Not even the avionics packages for 50 F-8 fighter aircraft would affect the Taiwan-Mainland balance. (That balance would continue, as in the past, to be heavily in favor of the Mainland; it was not so much the raw numbers that counted as the cost of conquest, the possibility of American intervention, and the post-invasion political consequences that kept Beijing's forces out of Taipei.) Of perhaps equal importance was the kinds and levels of American military sales to Taiwan and Taipei's increasing capability to provide for its defense through its own efforts. During the 1980s, the slow decline in the level of American military sales, from the $850 million peak at the beginning of the 1980s, would not materially constrain Taiwanese defense capabilities. Even during the 1990s a sufficiency of funds ought to be available, and were Beijing to evince unpeaceful intentions, the August 1982 Communique, to say nothing of the Taiwan Relations Act, itself provided for a break in the dollar decline. Moreover, Taiwan was providing itself with a modern, domestically designed (at least partly) fighter and an ever-higher portion of its other defense needs. (And, it should be noted, the United States had even gone beyond the August Communique in allowing private American firms to contract with Taiwan in defense modernization.) The most important items to Taiwan's defense were air defense and anti-ship munitions; both were being provided, over the foreseeable future, in reasonable quantities and qualities.

The more important question was the role of the United States in assisting China in the general sphere of economic modernization, for in the long run an economically modernized China would supply itself with the military means to overcome Taiwan with increasing ease. No way existed for the United States to escape the dilemma of helping Beijing produce the industrial capacity which the Mainland could eventually convert for military use against Taiwan, so long as Washington considered its interest in retaining a close relationship with China to be paramount. The United States could pretend to sell "defensive" only arms to Beijing, and it could hope that establishing strong working ties with Chinese enterprises at all levels of the economy would convert Beijing into an interdependent, peace-loving, free-trade nation like others in the Pacific Basin. Eventually, however, China would make itself more nearly independent of America economically (in the sense that it would have, at home, the industrial capacity, the financial strength, the markets, and the up-to-date technology to decrease its relative dependence on the outside). That would probably not come until the turn of the century, to be sure, and until then Taiwan would, therefore, be relatively safe.

The question was thus not, at base, military or even economic. Rather, it was political policies and attitudes that counted. Taiwan's safety depended on the strength of the support it could muster in the American Congress, on the attitudes of post-Reagan American Administrations, on the length and swiftness of Sino-Soviet rapproachement, on the character of political alignments in the regions around China, on the speed of democratization in Taiwan, and other such factors. The best the United States could do was to help provide a stable security situation in the Taiwan Straits--that national interest was already written into American law--and to encourage Nationalist and Communist to work out their differences in a peaceful manner without outside pressure. This latter task was difficult, to say the least, as neither Washington nor the two Chinese capitals favored another round of American mediation. But a negotiated solution, with or (preferably) without American participation, would remain the only way to put an end to the Taiwan problem (aside from Chinese acquiescence in Taiwan's independence, an impossibility for the forseeable future) in a peaceful manner. Until then, the United States would have to continue its central involvement in this last expression of the Chinese civil war and continue its role as Taiwan's security guarantor.

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[2] For Chinese foreign policy under Mao, see, *inter alia*. A. Doak Barnett, *Communist China and Asia* (New York: Harper, 1960); Harold C. Hinton, *China's Turbulent Quest* (New York: MacMillan, 1972); John Gittings, *The World and China, 1922-1972* (London: Methuen, 1974); and Ishwer C. Ojha, *Chinese Foreign Policy in an Age of Transition* (Boston: Beacon, 1969). Many interpretations of Chinese foreign policy exist, each usually explaining the whole by reference to one or another part of the picture--often a single factor. No integrated "model" of Chinese foreign policy yet exists that meets the two essential test of any theory: capability of explaining most facets and developments on the basis of a small number of carefully defined variables each meaningfully related to the others; and general acceptance by scholars in the field.

What follows below is one person's explanation. It is, however, based on a more extensive model that appears to meet the first criteria at least. For the author's already published work along these lines, see his "Political and Strategic Aspects of Chinese Foreign Policy," in Donald C. Hellmann (ed.), *China and Japan: A New Balance of Power* (Lexington, Mass.: D.C. Heath, 1976), pp. 197-268, "National Interests and Objectives of the People's Republic of China," in U. Alexis Johnson *et. al* (eds.), *China Policy for the Next Decade* (Boston: Oelgeschlager, Gunn, and Hain, 1984); "China's New Dynamism in the Strategic Triangle," *Current History*, September 1983, pp. 241 *et seq.*; and "The United States and China in the New Asian Balance of Power," *Current History*, September, 1985, pp. 241 *et seq.*

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[9] All analyses of trangular international relations meet with grave diffculties. Theoretical models must depend, in the last analysis, on some agreed measure of national power, which is unavailable despite its being one of the central concepts of international relations. Practical analyses, on the other hand, necessarily suffer in addition from the need to base conclusions on "inside" data (e.g., details of decision-making) generally not available, plus assessments of policy-maker attitudes mostly impossible to make with accuracy. That is to say nothing of the innate difficulty of dealing with different cultural norms and linguistic diversity represented by English, Russian, and Chinese. For representative theoretical work, see Theodore Caplow, Two Against One: Coalitions in Triads (Englewood-Cliffs, N.J.: Prentice-Hall, 1968; Scott Boorman, The Protracted Game: A Wei-ch'i Interpretation of Maoist Revolutionary Strategy (New York: Oxford University Press, 1969); Peter Kien-hong Yu, A Strategic Model of Chinese Checkers: Power and Exchange in Beijing's Interactions with Washington and Moscow (New York: Peter Lang, 1984); Thomas W. Robinson, China in a Tripolar World (New York: Council on Foreign Relations, 1974), and Lowell Dittmer, "The Strategic Triangle: An Elementary Game-Theoretic Analysis, World Politics, July 1981, pp. 488-515. Renditions of Sino-Soviet-American relations include Richard Ashley, The Political Economy of War and Peace: The Sino-Soviet-American

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[18] Harlan Jencks, From Muskets to Missiles: Politics and Professionalism in the Chinese Army, 1945-1981 (Boulder, Colo.: Westview Press, 1982); Gerald Segan and William T. Tow (eds.), Chinese Defense Policy (Urbana: University of Illinois Press, 1984), pp. 98-113, which also lists the relevant literature; and Ellis Joffe and Gerald Segal, "The PLA Under Modern Conditions," Survival, July/August 1985, pp. 146-157.

[19] Robert G. Sutter, "Strategic and Economic Imperatives and China's Third World Policy," in Lillian Craig Harris and Robert Worden (eds.), China and the Third World (Dover, Mass.: Arden House, 1986), pp. 14-33; Samuel S. Kim, China, the United Nations, and World Order (Princeton: Princeton University Press, 1979); and Samuel S. Kim, "China and the Third World: In Search of a Neorealist World Policy," in Samuel S. Kim (ed.), China and the World (Boulder, Colo.: Westview Press, 1984), pp. 178-214.

[20] Roy Hofheintz, Jr. and Kent Calder, The East Asia Edge (New York: Basic Books, 1982); James W. Morley (ed.), The Pacific Basin: New Challenges for the United States (New York: The Academy of Political Science, 1986); Lawrence Krause and Sueo Sekiguchi (eds.), Economic Interaction in the Pacific Basin (Washington, D.C.: The Brookings Institution, 1980); and The Pacific Community Concept: A Select Annotated Bibliography (Tokyo: Japan Center for International Exchange, 1982). Deng Kiaoping was, of course, aware of these developments and, partly on that basis, actively advocated rapid economic modernization as early as 1975. See Selected Works of Deng Kiaoping (Beijing: Renmin Chubanshe, 1983), pp. 51-165, and Kenneth Lieberthal (ed.), "The Politics of Modernization: Central Committee Documents of the Mid-1970s," Chinese Law and Government, Spring-Summer, 1979.

[21] We discuss this in detail below, pp. 28-39. Following are the author's sketch of some of the "rules of the Asian international system:

1. No active military participation by either superpower in Asian regional conflicts. (The exceptions, Vietnam and Afghanistan, prove the rule: both were -- or are being--overcome by combined military action of the offended parties and the assistance of the other superpower;
2. No direct superpower conflict in Asia. The exceptions--Korea, Vietnam, and the Sino-Soviet border conflict--demonstrate the rule again: each proved too costly in terms of domestic

economic disorders, military redeployments, and diplomatic realignments.

3. Local balances are established and maintained in Northeast, Southeast, and South Asia, with the relevant communist and non-communist powers backed as needed by the three members of the strategic triange. Therefore, no regional conflicts must be allowed. (The exception, Vietnamese aggression against Kampuchea, proves the rule: that act brought on a Chinese punative campaign and American-Chinese supply to the Kampuchean resistance in attempts to restore the status quo.)
4. Asia is bifrucated economically into Island Asia and Continental Asia, with greatly difference characteristics and with Island Asia leading the way.

[22] Whereas the "measurement" of national power is impossible to undertake in any reasonably accurate gross or, more importantly, situationally relevant manner, it is clear that restoration of peace, in 1949, national unity under a strong central government, and rapid economic and military growth all placed China in the front line of major powers. Otherwise, China would not have carried out military actions against nearly all of its neighbors and against both superpowers, to say nothing of pursuing a policy of participation, intervention, and expansion of influence throughout Asia and beyond. See, in this regard, the author;s "Hans J. Morgenthau's Theory of International Relations" revised version, January 1976, 72 pages.

[23] There is no exception to this. Britain, France, Germany, the United States, Japan, and the Soviet Union (to mention only the major modern powrs) have all acted in this manner, as did the Roman Empire, the Greek city-states, various Chinese dynasties, and many others. One has only to peruse Toynbee's A Study in History to grasp this central fact of international relations--which, it should be noted, is invariant of regime-type, economic system, or ideological outlook.

[24] Thomas W. Robinson, "China's Dew Dynamism in the Strategic Triangle," Current History, September 1983, pp. 241-244ff, and the "The United States and China in the New Asian Balance of Power," Current History, September 1985, pp. 231-244ff. Morgenthau was not the first to discover this law, expressed by him as "interest pursued as power" (the theme of Politics Among Nations (New York: Knopf, 1951 and succeeding editions). It can also be found throughout history, uttered early by Thucidides as "men rule where they can," The Peloponnesian War (Harmondsworth, Middlesex, England: Penguin Books, 1954), Book 5, Paragraph 104 [p. 404].

[25] On Chinese politics after Mao, see Roger Garside, Coming Alive: China After the Cultural Revolution (New York: McGraw-Hill, 1981); Peter Moody, Chinese Politics After Mao (New York: Praeger, 1983); Stuart Scram, "Ideology and Politics in China Since the Third Plenum, 1978-1984," The China Quarterly, September 1984, pp. 417-461; Michael Oksenberg and Richard Bush, "China's Political Evolution, 1972-1982," Problems of Communism, September-October 1982, pp. 1-19. On post-Mao Chinese economics, see the series of articles in The China Quarterly of December 1984; Joint Economic Committee, 99th Congress, China's Economy Looks Toward the Year 2000 (Washington, DC: Government Printing Office, 1986, two volumes) and predessor volumes in that series; Edwin Lim et al, China: Long-Term Development Issues and Options (Baltimore: John Hopkins University Press for the World Bank, 1985); Jan Prybyla, "From Mao to Market," Problems of Communism, January-February 1986, pp. 21-38; and A. Doak Barnett, China's Economy in Global Perspective (Washington, DC: The Brookings Institution, 1981).

[26] Harry Harding (ed.), China's Foreign Relations in the 1980s (New Haven: Yale

University Preas, 1984; Robert Sutter, Chinese Foreign Policy: Developments After Mao (New York: Praeger, 1986); Samuel S. Kim (ed.), China and the World: Chinese Foreign Policy in the Post-Mao Era (Boulder, CO: Westview Press, 1984), especially chapters 5, 6, 9, and 10.

[27] "Communique of the Third Plenum of the Eleventh Central Committee, Peking Review, December 29, 1978, pp. 6-16; Peter Moody, Chinese Politics After Mao, op. cit; Jurgen Domes, The Government and Politics of China (New York: Praeger, 1985); Stuart Schram, "Mao Study: Retrospects and Prospect," Problems of Communism, March-April 1984, pp. 95-125; Richard Nethercut, "Leadership in China: Rivalry, Reform, and Renewal", Problems of Communism, March-April 1983, pp. 30-46; Ellis Joffe, "Party and Military in China: Professionalism in Command?", Problems of Communism, September-October, 1983, pp. 48-63; William deB Mills, "Generational Change in China", Problems of Communism, November-December 1983, pp. 16-35; China in Transition, special issue of Journal of International Affairs, Winter 1986; "Decision of the Chinese Communist Party Central Committee on Reform of the Economic Structure," Beijing Review, October 29, 1984, pp. I-XVI.

[28] organization

[29] Commentator, "Theory and Practice", Renmin Ribao, December 7, 1984, p. 1 (translation in Foreign Broadcast Information Service, Daily Report: China [FBIS-China] December 7, 1984, pp. K1-K2; the famous correction, "We cannot expect the writings of Marx and Lenin of that time to provide solutions to all our current problems" is in Renmin Jibao, December 8, p. 1 (translation in FBIS-China, December 10, 1984, p. K21).

[30] David M. Lampton, "Chinese Politics: The Bargaining Treadmill," paper presented to the Fifteenth Sino-American Conference on Mainland China, June 8-14, 1986; Kenneth Lieberthal and Michael Oksenberg, Bureaucratic Politics and Chinese Energy Development (Washington, DC: Department of Commerce, 1986); Harry Harding, Political Development in Post-Mao China, in Barnett and Clough (eds.), Modernizing China, op. cit., pp. 13-38; China's Economy Looks Toward the Year 2000, op. cit., Vol. I, Part IV, "Industry, Transportation, and Construction", pp. 487-645; Thomas W. Robinson, "The Asiatic Mode of Politics; or, Is China a Marxist-Leninist State?", in King-yu Chang (ed.), Perspectives on Development in Mainland China (Boulder, CO: Westview Press, 1985), pp. 235-250.

[31] Chi Su, "China and the Soviet Union: 'Principled, Salutary, and Tempered' Management of Conflict," in Samuel S. Kim (ed.), China and the World, op. cit., pp. 135-160 (this source depends on a careful reading of Russian and Chinese documents, especially M.S. Ukraintsev [M.S. Kapitsa]; "Soviet-Chinese Relations: Problems and Prospects", Problemiy Dal'nego Vostoka, No. 2, 1982, pp. 15-24; Donald S. Zagoria, "The Moscow-Beijing Detente", Foreign Affairs, Spring 1983, pp. 853-873; William E. Griffith, "Sino-Soviet Rapproachement," Problems of Communism, March-April 1983, pp. 20-29. Signs of change in Chinese policy were present before 1979. See Thomas M. Gottlieb, "The Hundred-Day Thaw in China's Soviet Policy", Contemporary China, Summer 1979, pp. 3-14. The present author obtained an impression of attitudinal change during a visit to the Chinese Military Academy, May 1979. See also Jonathan Pollock, The Sino-Soviet Rivalry and the Chinese Security Debate (Santa Monica, CA: The Rand Corporation, 1982).

[32] For Sino-American military relations, see Senate Committee on Foreign Relations, The Implications of U.S.-China Military Cooperation (Washington, DC: Government Printing Office, 1981); Thomas W. Robinson, "Choice and Consequence in Sino-American Relations," Orbis, Spring 1981, pp. 29-51; Kerry B. Dumbaugh and Richard F. Grimmett, U.S. Arms Sales to China (Washington, DC: Congressional Research Service, July 8, 1985); Thomas W. Robinson, "Boosting

China's Military: Lessons for Washington," Far Eastern Economic Review, June 13, 1985, pp. 12-13; and Fred Denis Simon and William T. Tow, "U.S.-PRC Military Technology Transfer Politics: Going Beyond the Anti-Soviet Rationale", draft, December, 1986, 53 pages. On student exchanges, see David M. Lampton, A Relationship Restored: Trends in U.S.-China Educational Exchanges, 1978-1984 (Washington, DC: National Academy Press, 1986). American-Chinese trade may be followed in Helen Louis Noyes, "United States-China Trade", in China's Economy Looks Toward the Year 2000, op. cit., Vol. II, pp. 335-347. For technology, see papers presented at an Office of Technology Assessment workshop on technology transfer to China, April 18-19, 1985 by Denis Fred Simon, Jonathan D. Pollock, Ronnie L. Goldberg, Richard P. Suttmeier, Thomas Fingar, and Kim Woodard; Wendy Frieman, "National Security Risks of Dual-Use Transfers to China," Office of Technology Assessment, July 1986; Richard P. Suttmeier, Science, Technology, and China's Drive for Modernization (Stanford, CA: Hoover Institution Press, 1980); and William T. Tow, "The U.S., P.R.C., and Japan: Military Technology Transfer Policies and Strategic Collaboration," paper presented to the Fifteenth Sino-American Conference on Mainland China, June 8-14, 24 pages. For tourism, consult the Yearbook of China Tourism Statistics (Beijing: National Tourism Administration of the People's Republic of China, 1985 et seq), and the files of the Sub-Committee on U.S.-China Tourism, National Council on U.S.-China Trade.

[33] On the upsurge of Sino-Soviet trade, technology transfer agreements, and exchange of delegations, see William deB. Mills, "Gorbachev and the Future of Sino-Soviet Relations," Political Science Quarterly, December 1986, pp. 535-557 and the sources quoted therein.

[34] James C. Hsiung (ed.), Beyond China's Independent Foreign Policy (New York: Praeger, 1985); Thomas Fingar (ed.), China's Quest for Independence: Policy Evolution in the 1970s, op. cit.; and Michael Yahuda, Towards the End of Isolationism: China's Foreign Policy After Mao (New York: St. Martin's Press, 1983).

[35] Robert Manning, "The Third World Looks at China", in Lillian Craig Harris and Robert Worden (eds.), China and the Third World, op. cit., pp. 139-155; John Mortimer, The Third World Coalition in World Politics (Boulder, CO: Westview Press, 1984); Richard L. Jackson, The Non-Aligned, the United Nations, and the Superpowers (New York: Praeger, 1983); and A.W. Singham, The Non-Aligned Movement in World Politics (Westport, Conn.: Whirlwind Books, 1978).

[36] The cause, always, was comparative attitudes toward the Soviet Union. In Angola, Beijing sided with the UNITA opposition forces led by Jonas Savimbi and supplied him with arms after the MPLA government elected to bet its future on good relations with Moscow. Toward Ethiopia, China went over to its regional opponent, Somalia, after the Mengestu government decided to link Addas Abba closely with Moscow. China early on broke sharply with Cuba after Fidel Castro decided to ally itself with Moscow. With regard to India, Beijing already had very bad relations with New Delhi as a result of the two Chinese invasions of 1959 and 1962. But things got worse once the latter elected in 1965 and 1971 to establish a strong security tie with the Kremlin. India, one of the original convenors of the "non-aligned" conferences, regarded China as a competitor for Third World leadership once the short-lived "India and China are brothers" period of the mid-1950s had passed. So far as Syria was concerned, the only question for Damascus was who would provide it with the military supplies necessary to do battle with Israel. Moscow could, Beijing could not. Therefore, Syria chose the former.

[37] Victor Argy, The Postwar International Money Crisis: An Analysis (London:

George Allen and Unwin, 1981); Michael Stewart, The Age of Interdependence: Economic Policy in a Shrinking World (Cambridge, MA: MIT Press, 1984); William R. Cline, International Debt and the Stability of the World Economy (Washington, DC: Institute for International Economics, 1983); Susan Strange, Crisis Capitalism (New York: Blackwell, 1986); and Miles Kahler (ed.), The Politics of International Debt (Cornell: Cornell University Press, 1986).

[38] Samuel P. S. Ho and Ralph W. Huenemann, China's Open Door Policy: The Quest for Technology and Capital (Vancouver: University of British Columbia Press, 1984); Wolfgang Klenner and Kurt Wievegart, The Chinese Economy: Structure and Reform in the Domestic Economy and in Foreign Trade (Oxford: Transactions Books, 1985); S. Feuchtwang and A. Hussain, The Chinese Economic Reforms (London: Croom Helm, 1983).

[39] Seymour J. Deitchman, Military Power and the Advance of Technology (Boulder, CO: Westview Press, 1983); James Digby, Precision-Guided Munitions (London: International Institute for Strategic Studies, Adelphi Paper No. 118, 1975); William H. McNeill, The Pursuit of Power: Technology, Armed Force, and Society Since AD 1000 (Chicago: University of Chicago Press, 1982); I. B. Holley, Ideas and Weapons (Washington, DC: Government Printing Office, 1983); Franklin D. Margiotta and Ralph Sanders (eds.), Technology, Strategy and National Security (Washington, DC: National Defense University Press, 1985); Karl Lautenschlagger, Technology and the Evolution of Naval Warfare, 1851-2000 (Washington, DC: National Academy Press, 1984).

[40] Paul H.B. Godwin (ed.), The Chinese Defense Establishment: Continuity and Change in the 1980s (Boulder, CO: Westview Press, 1983); Paul H.B.Godwin, "The Chinese Defense Establishment in Transition: The Passing of a Revolutionary Army," in Barnett and Clough (eds.), Modernizing China, op. cit., pp. 63-80; Gerald Segal and William T. Tow (eds.), Chinese Defense Policy, op. cit.

[41] The evidence concerning the relationship between technological change and military strategy is unclear, and it is also not readily apparent whether technological change in military affairs is speeding up in all fields. The sources listed in footnote 39 stand on both sides of these issues. In the case of China, however, it seems reasonably apparent that a lag exists in reception of military technology from abroad and changes in strategy consequent upon the diffusion within the country of modern weapons systems. The Spey engine case is an important illustration of the former and the relative slowness of the Chinese military to move away from the obvious anachronisms of the Maoist military style bears witness to the latter.

[42] Diplomacy is thus the efficiency with which a nation's leadership manages the country's foreign affairs. The range can be quite wide: an otherwise powerful state can through poor management squander its resources, leading to needless failures or even defeat in war. Examples abound: Germany in the years leading to 1914; Britain between 1935 and 1939; America during the Vietnam era, to name a few. It is also possible for a state with relatively few material assets to maximize their utility through superior diplomacy. Usually such a propensity is found among small states, such as the Netherlands, Israel, Thailand, and Taiwan, to name some obvious instances. For further thinking on this, see the author's "Diplomacy as Political Steersmanship," appendix to his "China in a Tripolar World", ms., The Council on Foreign Relations, 1971. Even such principal writers as Hans Morgenthau miss this essential point, about which much more work is needed.

[43] Ninety-ninth Congress, Joint Economic Committee, China's Economy Looks Toward the Year 2000, Vol. I, The Four Modernizations (Washington, DC: Government Printing Office, 1986); and Elizabeth J. Perry and Christine Wong (eds.), The Political Economy of Reform in Post-Mao China (Cambridge, MA:

Harvard University Press, 1985).

[44] China's Economy Looks Toward the Year 2000, op. cit., Vol. II, Economic Openness in Modernizing China.

[45] John F. Copper, "China's Foreign Aid Program: An Analysis and Update," in China's Economy Looks Toward the Year 2000, Vol. II, op. cit., pp. 499-518; C. I. Eugene Kim, "South Korea in 1985", and Chae-jin Lee, South Korea in 1984", Asian Survey, January 1986 and January 1985, pp. 66-77 and 80-89 respectively; and James C. Hsiung, "Taiwan in 1985" and "Taiwan in 1984," Asian Survey, January 1985 and January 1984, pp. 93-101 and 90-96, respectively.

[46] Roger Garside, Coming Alive: China After the Cultural Revolution (New York: McGraw-Hill, 1981); Liang Heng and Judith Shapiro, Son of the Revolution (New York: Random House, 1984); Perry Link (ed.), Stubborn Weeds: Popular and Controversial Literature After the Cultural Revolution (Bloomington: Indiana University Press, 1983); Fox Butterfield, China: Alive in a Bitter Sea (New York: Times Books, 1982).

[47] Thomas C. Roberts, The Chinese People's Militia and the Doctrine of People's War (Washington, DC: National Defense University Press, 1983); Harlan W. Jencks, From Muskets to Missiles: Politics and Professionalism in the Chinese Army, 1945-1981 (Boulder, CO: Westview Press, 1982); Ellis Joffe and Gerald Segal, "The PLA Under Modern Conditions", Survival, July/August 1985, pp. 146-157; Thomas W. Robinson, "Military Modernization in China in the 1980s," The China Quarterly, June 1982, pp. 231-252.

[48] These developments are detailed below, Part III.

[49] Various descriptions of recent factional differences in China have been advanced. See Kenneth Lieberthal, "Domestic Politics and Foreign Policy," in Harry Harding (ed.), China's Foreign Relations in the 1980s, op. cit., pp. 43-70; Carol Lee Hamrin, "Competing 'Policy Packages' in post-Mao China," Asian Survey, May 1984, pp. 487-515; Michel Oksenberg and Kenneth Lieberthal, Bureaucratic Politics and Chinese Energy Development (Washington, DC: Department of Commerce, 1986); David Michael Lampton, "Chinese Politics: The Bargaining Treadmill," paper presented to the Fifteenth Sino-American Conference on Mainland China, Taipei, June 8-14, 1986: and Dorothy J. Solinger, "The Fifth National People's Congress and the Process of Policymaking: Reform, Readjustment, and the Opposition," in King-yu Chang (ed.), The Emerging Teng System: Orientation, Policies, and Implications (Taipei: Institute of International Relations, 1982).

[50] Nobutoshi Akao (ed.), Japan's Economic Security (New York: St. Martin's Press, 1983); J.W.M. Chapmen et. al., Japan's Quest for Comprehensive Security: A Global Search for Economic Security (Boulder, CO: Westview Press, 1985); Robert Taylor, The Sino-Japanese Axis: A New Force in Asia? (London: Athlone press, 1985).

[51] A nation becomes a global power--perhaps even a superpower--once it has the requisite means of power in enough quantity. But "how much" is a relative question, for in the case of China its Asian neighbors also would be expanding their own national power as well. The net "balance of power," presuming other Asian states saw the need to counteract China's potential and actually come together for the purpose, might not be in China's favor at all. And this says nothing of the continuing roles and presence in Asia of the United States and the Soviet Union.

[52] See Robinson, "Triple Detente? The Strategic Triangle in the Late Twentieth Century," op. cit., footnote 9.

[53] For details, see Thomas P. Thornton, "The USSR and Asia in 1983: Staying the Brezhnev Course", Asian Survey, January 1984, pp. 1-17; Donald S. Zagoria, "The USSR and Asia in 1984," Asian Survey, January 1985, pp. 21-32; Zagoria, "The USSR and Asia in 1985: The First Year of Gorbachev," Asian

Survey, January 1986, pp. 15-29; and Chi Su, "China and the Soviet Union: 'Principled, Saluatory, and Tempered' Management of Conflict," in Samuel S. Kim (ed.), *China and the World: Chinese Foreign Policy in the Post-Mao Era* (Boulder, CO: Westview Press, 1984), pp. 135-160.

[54] William deB. Mills, "Gorbachev and thc Future of Sino-Soviet Relations," *Political Science Quarterly*, Vol. 101, No. 4, pp. 535-557.

[55] See "The United States and Asia," and "China in 1984" [1985][1986], in the January isaue of *Asian Survey*, 1985, 1986, and 1987, respectively.

[56] Steven I. Levine, "China and the United States: Limits of Interaction", in Samual S. Kim (ed.), *China and the World*, *op.cit.*, footnote 53, pp. 113-134.

[57] See the *Asian Survey*, yearly summary articles on North Korea in the January issue, 1981-1987, and Chung Chong-wook, "Triangular Diplomacy and the Inter-Korean Dialogue" (Claremont, CA: Keck Center for International Strategic Studies, No. 6, 1986).

[58] Charles Wolf, Jr. *et. al.*, *The Changing Balance: South and North Korean Capabilities for Long-Tern Military Competition* (Santa Monica, CA: The Rand Corporation, 1985); *Asian Security* (Tokyo: Research Institute for Peace and Security, 1980-, yearly). The American strategy was indeed to use nuclear weapons, and American forces in and around Korea were configured to employ such weapons in territorial defense of the South and offensively against North Korean military and population targets.

[59] Pyongyang knew that only the simultaneous occurance of major disorders in the South and American military involvement outside of Northeast Asia would allow any chance at all of the quick success necessary in a Blitzkrieg strike. American decisionmakers knew that too, and at least claimed to be able to fight in Korea at the same time, say, as in the Middle East. See the annual *Posture Statements* and the *Reports* of the Secretary of Defense to the Congress (Washington, DC: Government Printing Office, 1980ff). See also Yong Choi, "The North Korean Military Buildup and Its Impact on North Korean Military Strategy in the 1980s," *Asian Survey*, March 1985, pp. 341-355; and Peter J. Hayes, "Problems of Extended Deterrence in the Asia-Pacific Region With Particular Reference to Korea," paper presented to the Second Annual Conference of The Council on U.S.-Korean Security Studies, Bloomington, Indiana, December 5, 1986, 40 pages.

[60] These Chinese sentiments have been conveyed privately to the Americans by Tai Bingwei, Head of Asian and Pacific Studies, Institute of International Studies in Beijing, at a Professors World Peace Academy conference in Los Angeles, February 16, 1985, and by Ding Shinghao, at the Thirteenth Annual Meeting of the Mid-Atlantic Region of the Association for Asian Studies, Princeton University, November 10, 1984, as noted by the author on both occasions.

[61] Yong-chool Ha, "Soviet Perceptions of Soviet-North Korean Relations," *Asian Survey*, May 1986, pp. 573-590; Joseph M. Ha, "Soviet Perceptions of North Korea," *Asian Perspective*, Fall-Winter 1982, pp. 105-131; and Lee Such-ho, "Major Determinants of Soviet Support for North Korea", *Korea and World Affairs*, Spring 1985, pp. 91-115.

[62] Douglas Pike, "The Impact of the Sino-Soviet Dispute on Southeast Asia," in Herbert J. Ellison (ed.), *The Sino-Soviet Conflict: A Global Perspective* (Seattle: University of Washington Press, 1982), pp. 185-205.

[63] Among other sources, see Takashi Tajima, *China and Southeast Asia: Strategic Interests and Policy Perspectives* (London: International Institute for Strategic Studies, Adelphi Paper 172, 1982); John W. Garver, "Sino-Vietnamese Conflict and Sino-American Rapproachement", *Political Science Quarterly*, Fall 1982, pp. 445-464; Nguyen Manh Hung, "The Sino-Vietnamese Conflict: Power Play Among Communist Neighbors", *Asian Survey*, November 1979, pp. 1037-1052; Harlan

W. Jencks, "China's 'Punative' War on Vietnam: A Military Assessment", Asian Survey, August 1979, pp. 801-815.

[64] Sheldon W. Simon, "David and Goliath: Small Power-Great Power Security Relations in Southeast Asia", Asian Survey, March 1983, pp. 302-315. Robert A. Scalapino and Yusuf Wanandi (eds.), Economic, Political, and Security Issues in Southeast Asia in the 1980s (Berkeley: University of California Press, 1982).

[65] Gareth Porter, "China in Southeast Asia", Current History, September 1986, pp. 249-252ff; Sheldon Simon, "China and Southeast Asia: Protector or Predator?", Australian Outlook, August 1985, pp. 93-98; Lee Deng-ker, The Recent Border Conflict Between Mainland China and Vietnam", Issues and Studies, May 1984, pp. 9-12; Chang Pao-min, "Beijing versus Hanoi: The Diplomacy over Kampuchea", Asian Survey, May 1983, pp. 598-618; Chang Pao-min, "Some Reflections on the Sino-Vietnamese Conflict over Kampuchea," International Affairs, Summer 1983, pp. 381-390; Gareth Porter, "Hanoi's Strategic Perspective and the Sino-Vietnamese Conflict," Pacific Affairs, Spring 1984, pp. 7-25.

[66] William P. Barnds, India, Pakistan, and the Great Powers (New York: Praeger, 1972); Bhabani Sen-Gupta, The Fulcrum of Asia: Relations Among China, India, Pakistan, and the USSR (New York: Pegasus, 1975); Yaacov Vertzberger, China's Southwestern Strategy: Encirclement and Counterencirclement (New York: Praeger, 1985).

[67] Surjit Mansingh, India's Search for Power (Beverly Hills, CA: Sage, 1984); Robert Horn, Soviet-Indian Relations: Issues and Influence (Praeger, 1982); Zalmay Khalilzad, Security in Southern Asia (New York: St. Martin's, 1984).

[68] B. K. Kumar, "Nuclear Nexus Between Peking and Islamabad: An Overview of Some Significant Developments", Issues and Studies, August 1985, pp. 140-155; Manoranhan Mohanty, "India-China Relations: A Positive Frame," India Quarterly, January-March 1985, pp. 17-22; Yaacov Vertzberger, "The Political Economy of Sino-Pakistan Relations: Trade and Aid, 1963-1982," Asian Survey, May 1983, pp. 637-650; Sabiha Hasan. "Sino-Indian Relations: The Recent phase," Pakistani Horizon, Vol. 36, No. 1 (1983), pp. 101-111; Yaacov Vertzberger, "India's Border Conflict with China: A Perceptual Analysis," Contemporary History, October 1982, pp. 607-632; Robert C. Horn, "The Soviet Union and Sino-India Relations", Orbis, Winter 1983, pp. 889-906.

[69] See Lillian C. Harris, China's Foreign Policy Toward the Third World, op. cit. pp. 50-87.

[70] The Economist, November 17, 1984, p. 40; Aviation Week and Space Technology, April 11, 1983, pp. 16-18, and August 15, 1983, pp. 129-134 and 160-161; U.S. Arms Control and Disarmament Agency, World Military Expenditures and Arms Transfers, 1986 and 1985 (Washington, DC: ACDA, 1986 and 1985); Chang Ya-chun, "Communist China's Middle East Policy", Issues and Studies, July 1984, pp. 5-8.

[71] These trends and developments may be followed by consulting the Foreign Relations section of the "Quarterly Chronicle and Documentation" in The China Quarterly for the post-1979 period.

[72] Wang Naoqin et al, "Why 'Abstain'"?, Renmin Ribao, August 2, 1986, p. 7; Xin Hua She (New China News Agency), August 3, 1985; Lin Bih-jaw, "Peking's Ideology and policies in Southern Africa", Issues and Studies, March 1985, pp. 126-140; Steven Chan, "China's Foreign Policy and Africa", Round Table, October 1985, pp. 376-383; Chang Ya-chun, "Chao Tzu-yang's Visit to Africa," Issues and Studies, June 1983, pp. 10-13.

[73] Robert L. Worden, "China's Balancing Act: Cancun, The Third World, and Latin America", Asian Survey, May 1983, pp. 619-636; Chang Hu, "Wu Hsueh-ch'ien's Visit to Latin American" Issues and Studies, September 1984, pp. 10-

13; Li He, "Evolution of United States Policy Toward Latin America," Shijie Zhishi, August 1, 1984.

[74] Samuel S. Kim, China, the United Nations, and World Order, op. cit., is the standard reference. For recent developments, see Kim, "China and the Third World: In Search of a Neorealist World Policy," in Samuel S.Kim (ed.), China and the World, op. cit., pp. 178-214 and the sources cited therein.

[75] Robert L. Worden, "International Organizations: China's Third World Policy in Practice," in Harris and Worden (eds.), China and the Third World, op. cit., pp. 75-99; John F. Copper, "China and the Third World", Current History, September 1983, pp. 245-248ff; John F. Copper, "The PRC and the Third World: Rhetoric Versus Reality," Issues and Studies, March 1986, pp. 107-125.

[76] Yearbook of International Organizations (Brussels: Union of International Organizations, annually); Robert A. Mortimer, The Third World Coalition in International Politics (Boulder, CO: Westview Press, 1984); G. P. Deshpande, "Non-Alignment and the Chinese Perspectives in International Politics," International Studies, January-June 1981, pp. 471-476.

[77] This appears to be the weighted observations of the papers submitted to the Office of Technology Assessment project on technology transfer to China, 1985-1986, by Fred Denis Simon, William Tow, Kim Woodard, Richard P. Suttmeier, Jonathan Pollock, and Wendy Frieman, as well as much of the literature referred to below.

[78] Defense Intelligence Agency, "United States-China Military Relations, 1979-1985: Analysis and Chronology" (Washington, DC: Defense Intelligence Agency, April 30, 1986).

[79] Wendy Frieman, "Foreign Technology and Chinese Modernization," in Charles D. Lovejoy, Jr. and Bruce W. Watson (eds.], China's Military Reforms: International and Domestic Implications (Boulder, CO: Westview Press, 1986), pp. 51-86.

[80] Ellis Joffe, "Party and Military in China: Professionalism in Command?", Problems of Communism, September-October 1983, pp. 48-63; Paul H.B. Godwin, "Soldiers and Statesmen in Conflict: Chinese Defense and Foreign Policies in the 1980s," in Samual S. Kim (ed.), China and the World, op. cit., pp. 215-234; Ellis Joffe, "Civil-Military Relations", in Gerald Segal and William T. Tow (eds.), Chinese Defense Policy (Urbana: University of Illinois Press, 1984), pp. 15-35.

[81] A "projection force" would have to have several components: naval air, presumably using aircraft carriers; a marine landing force, together with ships to transport them and their equipment; a large air transport capability, along with refueling aircraft and protective fighter cover; sea control warships in sufficient numbers; and bases in allied foreign countries for supply. China had none of these in the 1980s and was not providing itself with any. It could not even project force 90 miles across the Taiwan Straits.

[82] Kerry B. Dumbaugh and Richard F. Grimmett, "U.S. Arms Sales to China", Congressional Research Service, July 8, 1985; and John W. DePauw, "The Potential for Military Trade," in Eugene K. Lawson (ed.), U.S.-China Trade: Problems and Prospects (forthcoming), draft ms., September 1986, 43 pp. The latter has a very helpful bibliography.

[83] The political pendelum was already moving to the more conservative side in 1986-1987, with the removal of Party Secretary Hu Yaobang and a wide range of other "liberal" officials as well as the return to authority of a group of elderly party chiefs led by Peng Zhen. If the pendulum theory of Chinese politics is accurate, as I believe it is, thc conservative reaction would be extensive in time and across issues. However, it would probably not go so far as in 1958 and 1965: a Mao Tse-tung was not present; the momentum for modernization was very strong; and the gaping jaws of another Cultural

Revolution would prompt any Chinese leadership to draw back.

[84] Dumbaugh and Grimmett detail these restrictions. See also Roger Sullivan, "U.S. Military Sales to China," The China Business Review, March-April 1986; Department of State Bulletin, August 1981, October 1981, and October 1982; and U.S. Department of State, Munitions Control Letter, no. 81, 1980.

[85] The Military Balance, 1983-1984; Handbook on the Chinese Armed Forces (Washington, DC: Defense Intelligence Agency, 1985]; Davil Muller, "China's SLBM in Perspective," U.S. Naval Institute Proceedings, March 1983, pp.125-127; and Robert Sutter, "Developments in China's Nuclear Weapons and Attitudes Toward Arms Control," in Lovejoy and Watson (eds.), China's Military Reforms, op. cit., pp. 101-110.

[86] David Salem, The People's Republic of China, International Law, and Arms Control (Baltimore: University of Maryland School of Law, 1982), pp. 17, 49-50, and 275; numerous press reports, especially during 1986; and B.K. Kumar, "Nuclear Nexus Between Peking and Islamabad: An Overview of Some Significant Developments," Issues and Studies, August 1985, pp, 140-150 together with the sources cited therein.

[87] Kim Woodard, "Technology Transfer and China's Energy Industries," draft paper for Office of Technology Assessment, April 18, 1986; Fred Denis Simon and William T. Tow, "US-PRC Military Technology Transfer Politics: Going Beyond the Anti-Soviet Rationale," draft ms, December 8, 1986; and China Business Development Group, Satellite Telecommunications Technology Transfer to China (Alexandria, VA, May 1986).

[88] For official American statements since the Auguat 18, 1982 U.S.-China Joint Communique, see Departmcnt of State, Current Policy, nos. 413, 444, 459, 460, 574, 729, 895, and 930 for the years 1982-1986.

[89] Ronald G. Mitchell, "China's Defense Spending in Transition", in 97th Congress, Joint Economic Committee, China Under the Four Modernizations, part 1 (Washington, DC: Government Printing Office, 1982), pp. 605-610; David L. Shambaugh, "Chinese Defense Industries: Indigenous and Foreign Procurement," in Paul Godwin (ed.), The Chinese Defense Establishment, op. cit., pp. 43-88; Richard J. Latham, "Implication of the Post-Mao Reform on the Chinese Defense Industries", in Lovejoy and Watson (eds.), China's Military Reforms, op. cit., pp. 35-50; Sydney Jammes, "Military Industry", in Segal and Tow (eds.), China's Defense Policy, op. cit., pp. 117-132; and Paul Hume Folta, "The Defense Industry of the People's Republic of China: Command Structure, Industries, Production, and Foreign Trade", ms., August 1, 1986.

[90] Richard Nixon, United States Foreign Policy for the 1970s, February 18, 1970, February 25, 1971, February 9, 1972, and May 3, 1973 (Washington, D.C.: Government Printing Office, dates cited); and United States Foreign Policy, 1972: A Report by the Secretary of State (Washington, D.C.: Government Printing Office, 1973). The 2 1/2 - 1 1/2 war terminology gradually disappeared from Department of Defense policy documents in the late 1970s and early 1980s.

[91] Rasul B. Rais, "Pakistan's Nuclear program: Prospects for Proliferation", Asian Survey, April 1985, pp. 458-472; Far Eastern Economic Review, December 12, 1985, pp. 24-25; Washington Post, November 4, 1986, p. 1.

[92] Yitzhak Shichor, "The Middle East," in Gerald Segal and William T. Tow (eds.), Chinese Defense Policy, op. cit., pp. 262-278; Lillian Craig Harris, "China's Support for People's War in the 1980s," in Lillian Craig Harris and Robert L. Worden (eds.), China and the Third World, op. cit., p. 134.

[93] According to Mark S. Roth in "United States-China Military Relations, 1979-1985", op. cit., there is a 2-3 year cycle in American-Chinese military relations, depending on the overall character of ties between the two nations. Thus, 1979-1980 was a time of optimism, 1981-1983 a period of strain, and

1983-1985 years of "reinvigoration." In 1986 and 1987, with the Chinese policy of distancing itself from the United States and detente with Moscow in effect, a period of quiescence in military relations set in.

[94] The Communique was favorable to the United States in the following regards: (1) the initial point from which arms sales to Taiwan was measured was very high, c. $850 million per annum; (2) the yearly declination in sales was quite small, c. $20 million, and thus the endpoint was some 35 years from 1982; (3) sales were inflation-discounted, so that the dollar amount could actually rise in some years; (4) the entire matter depended on American evaluation of the peaceful content of Chinese policy. If Washington judged Beijing to be acting in a non-peaceful manner, the agreement could be abrogated; (5) the agreement could be abrogated in any case (by China as well as the United States) merely by declaring it so, since it was a policy declaration of two sets of decisionmakers. Their successors did not have to accept the terms of the agreement, since it was not a treaty; (6) no definition of "qualitative" and "quantitative" limits was set. Thus, the United States could vary definitions to suit its policy purposes, as was in fact the case; and (7) a major loophole (self-defined by the United States) emerged: private technological assistance in military areas by American companies.

[95] The case "for" such a development rested on several propositions. First, Western students of socialist economies, and of the Chinese economy in particular, argued that it is not possible to maintain a mixed capitalist-socialist economy. Once China moved away from the standard centrally-planned Stalinist model, it would have no choice but to move most all the way to the other, capitalist, extreme. The Chinese leadership, understanding this also, would halt such movement before it got out of hand. Second, the relatively "easy" gains of the early 1980s in agriculture would not be replicated in the later 1980s in industry, not would agricultural productivity continue to make such large gains as before. Third, imported technology and associated economic systems could not be cleansed of the foreign political/cultural baggage that accompanied it. Seeing that, Deng and his successors would draw back. And fourth, the Soviet offer of major economic assistance was too attractive to miss.

[96] The Taiwan Relations Act declared that "any effort to determine the future of Taiwan by other than peaceful means [would be] a threat to the peace and security of the Western Pacific area and of grave concern to the United States"; and that America would not only supply arms to Taiwan but be ready of its own to "resist any resort to force or other form of coercion [e.g., boycotts or embargoes] that would jeporadize the security, or the social or economic system, of ... Taiwan." (Emphasis added.) That is the language of a unilateral security guarantee. Moreover, although future American Administrations might argue that agreements with Beijing could modify or overturn that American domestic law, it is a clear principle of international law as practiced by the United States for many decades to regard domestic laws as superior to policy declarations or executive agreements when they conflict. Only in the case of treaties (i.e., as ratified by the Senate) would the Taiwan Relations Act stand in danger. Thus, the United States remained in the middle of the Chinese civil war. See, in these regards, Martin L. Lasater, The Taiwan Issue in Sino-American Strategic Relations (Boulder, CO: Westview Press, 1984; Lester L. Wolff and David L. Simon (eds.], Legislative History of the Taiwan Relations Act (Jamaica, NY: American Association for Chinese Studies, 1982); and Louis Henkin, Foreign Affairs and the Constitution (New York: W.W. Norton, 1975).

[97] Martin L. Lasater (ed.), Beijing's Blockade Threat to Taiwan (Washington, DC: The Heritage Foundation, 1986); Martin L. Lasater, Taiwan: Facing

Mounting Threats (Washington, DC: The Heritage Foundation, 1987); and A. James Gregor and Maria Hsia Chang, The Iron Triangle, chapter 6, "The Security of the Republic of China on Taiwan" (Palo Alto, CA: Hoover Press, 1984).

AMERICAN FIRMS AND THE TRANSFER OF TECHNOLOGY TO CHINA:

HOW BUSINESS PEOPLE VIEW THE PROCESS

A Report for the Office of Technology Assessment

(Contract No. 633-51550)

February, 1987

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INTRODUCTION

Managing the international transfer of technology is tough work. It requires an ability to live in two worlds at the same time--the world of the supplying firm and the world of the purchasing end user--and to mesh the needs of both of these worlds into a workable pattern of activity.

The experience of even the oldest American China business hands dates only from the 1970's. Yet many firms doing business in China have already developed some unique and important ways of handling the special demands this rapidly changing market requires.

The men and women who live in these different worlds simultaneously are a special breed--pioneers in an environment that is changing more rapidly than anyone could have imagined only a decade ago. Many of them also possess a quite sophisticated understanding of what is needed to succeed in this market and have strong views about those things responsible for their successes and failures.

This study examines some of the ideas and impressions of business people from firms of varying sizes that are transferring technology to China. It also examines the factors that these American business people view as helpful and those that they perceive as stumbling blocks to their China projects.

The data for this study comes from three sources:

- A survey questionaire completed by forty one firms currently involved in the China market (See Appendix).
- Interviews with business people directly involved in China marketing projects.
- A roundtable discussion by nineteen business people who had completed the survey questionaire and who had also read a draft report outlining the findings of the survey. The discussion focused on ways that government might act to alleviate some of the problems American business people believe they face.

This study shows that:

- Most American firms involved in the China market see themselves as important agents in the transfer of technology; business people from large firms see themselves as transferring technology of a different level of sophistication and through different channels than do representatives of small firms
- Business people from representing large firms see their experience (and their problems) differently than do those from small firms
- Business people have contradictory perceptions about the role of government (both American and Chinese) in their marketing activities

-BUSINESS PEOPLE FEEL A NEED FOR NEW KINDS OF ASSISTANCE--FROM BOTH PUBLIC AND PRIVATE AGENCIES--IN THEIR EFFORTS TO NEGOTIATE THE COMPLEX PATHS TOWARD EFFECTIVE ACTIVITY IN CHINA.

PART I

THE DIFFERENT EXPERIENCE OF LARGE AND SMALL FIRMS IN CHINA

Large firms are different from small firms. They have different operating procedures, different bureaucratic arrangements, and different corporate cultures. And quite often, the ways in which large and small firms participate in foreign markets is different as well.

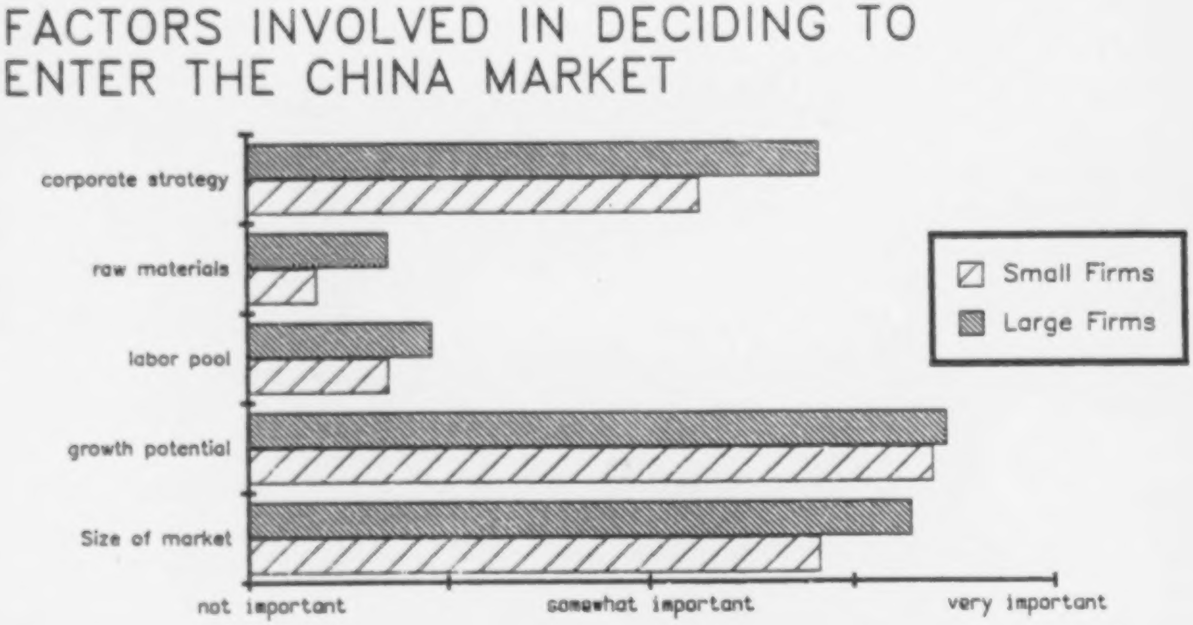
This is certainly the case for American firms entering new Asian markets such as China. The motives, pressures, and dynamics that drive firms of different size are often quite different. The experiences that result from these differences can also be quite diverse.

GETTING INVOLVED IN CHINA: SOME PERSPECTIVES FROM AMERICAN BUSINESS

American firms approach their entry into the China market from a variety of different perspectives. Most of the respondents that participated in this study mentioned the fact of China's size. "The world's largest single market" continues to hold a great deal of fascination for most American business people looking at international trade. (See Chart 1.)

China As a Part of Asia. Beyond the awareness of China's sheer size, however, often lies a more subtle sense of China's increasingly

CHART 1



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QUESTION 10: How important were these factors in your decision to enter the China market?

important role in the international economy. Our respondents spoke also of China's potential for rapid growth and of China's increasing links to other economies in the Pacific Rim. There is a stronger and stronger sense among executives looking at international trade that awareness of the Asian economy must be part of any viable corporate strategy and that China occupies an increasingly important place in the Asian economy as a whole.

Most American business people feel more comfortable with the idea of linkage in European markets than they do in Asian economies. The increasing integration of the European Economic Community allows business people to think in terms of production in one part of Europe, assembly in a second part, and entry into a distribution system in a third. While very real barriers still exist among the EEC members, it is a rare business person who has not approached entry into European markets from this integrated perspective. In spite of the stated need on the part of the Chinese government to generate foreign currency through export activity, perhaps no more than 10% of American business people formulate their initial China-entry strategies from the perspective of an integrated Asian market, looking at China's needs for new technologies in terms of the economy's relationship with the larger Asian market.

Prior Experience. China is not a market for newcomers to the world of international trade. Generally, firms that participate in the China market of the 1980's have considerable experience in other parts of the world. The firms that participated in this study--large and small--were already involved in international business activity across Asia

(ESPECIALLY TAIWAN AND KOREA) AND IN OTHER AREAS OF THE WORLD. 82% OF THE FIRMS HAD PRIOR EXPERIENCE IN OTHER PARTS OF ASIA OR IN LATIN AMERICA. (SEE TABLE 1.)

BUSINESS PEOPLE ACTIVE IN CHINA--ESPECIALLY SUCCESSFUL ONES--OFTEN ARGUE THAT THE CHINA MARKET IS NO MORE DIFFICULT THAN ANY OTHER. IT IS SIMPLY A MUCH DIFFERENT SORT OF MARKET THAN MOST OF THEM HAVE ENCOUNTERED BEFORE. THE MOST DIFFICULT ASPECT OF THIS NEW MARKET INVOLVES THE RAPIDLY SHIFTING RELATIONSHIPS BETWEEN CHINESE ENTERPRISE AND STATE AGENCIES, AND THE CHANGING POLICIES THAT ARE PUSHING CHINESE ENTERPRISE MANAGERS THEMSELVES TO BECOME THE PRIMARY PLAYERS IN THE SEARCH FOR NEW TECHNOLOGIES. FIRMS WITH EXPERIENCE IN OTHER AREAS OF THE WORLD HAVE DEVELOPED THE SORTS OF CAPABILITIES, SENSITIVITIES, AND EXPERIENCE REQUIRED TO NEGOTIATE THE UNEXPECTED PROBLEMS THAT ALMOST ALWAYS EMERGE DURING INTO A MARKET THAT IS CHANGING SO DRAMATICALLY.

THE PARTICIPANTS IN THIS STUDY WERE ALSO AWARE OF THE NEED TO THINK ABOUT THEIR CHINA ACTIVITIES IN TERMS OF SOME FORM OF LONG-TERM STRATEGY. IN THE EARLY 1980'S, THERE WERE A NUMBER OF CORPORATE ADVENTURERS WHO LOOKED TO CHINA FOR "QUICK HITS" IN THE FABLED MARKET OF ONE BILLION POTENTIAL CUSTOMERS. BUT THIS PHILOSOPHY HAS GIVEN WAY TO A MUCH DIFFERENT PERSPECTIVE. EVEN WHEN THEIR FIRMS PUSHED THEM TO OPERATE IN A SORT OF SHORT-RUN "MAKE-YOUR-NUMBERS-EVERY-QUARTER" MODE, MOST EXECUTIVES EXPRESSED THEIR THOUGHTS ABOUT CHINA IN TERMS OF SOME SORT OF LONG-TERM FRAMEWORK. THIS WAS ESPECIALLY TRUE FOR LARGE COMPANIES; SMALL COMPANIES TENDED TO BE MORE FORTHRIGHT IN ADMITTING THAT A GREAT DEAL OF THEIR ACTIVITY WAS DRIVEN BY SHORT-TERM CASH-FLOW NEEDS. (SEE CHART 2.)

Table 1

INTERNATIONAL BUSINESS ACTIVITY

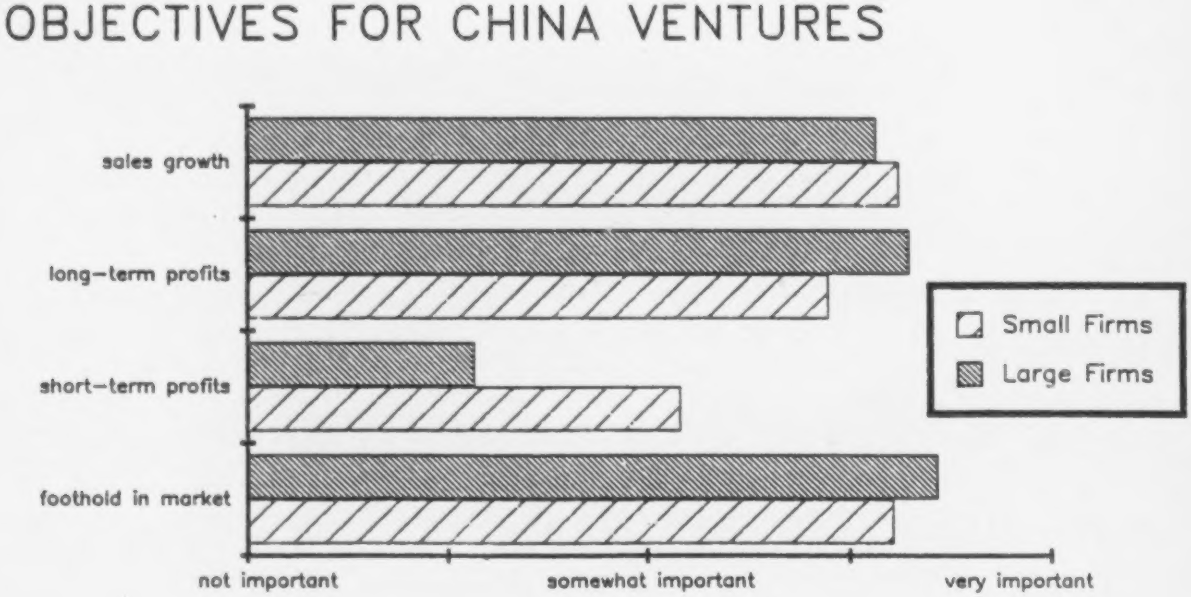
(percent of firms involved)

	Small Firms	Large Firms	All Firms
None	14.3%	0.0	7.3
India	42.9	66.7	51.2
Taiwan	57.1	88.9	69.7
Korea	57.1	88.9	70.7
L. America	76.2	88.9	80.5
Other	33.5	66.7	46.3

Question 7: With which developing countries besides China do you do business?

tab1

CHART 2



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QUESTION 11: How important were the following specific objectives for your China venture?

View of the Future. In spite of the somewhat gloomy picture of American business activity in China painted by the media during the past year, the majority of our respondents believed that their business activity in China was likely to increase in the near future or at least remain at the same level. These respondents remain essentially optimistic and upbeat about the future of their China markets. (See Table 2.)

TYPES OF CHINA BUSINESS ACTIVITY

The firms that participated in this study were involved in the following forms of business activity in China:

-joint ventures in which the firm entered into a partnership relationship with one or more Chinese parties

-licensing agreements in which some form of proprietary information was leased to a Chinese end-user

-assembly operations in which the American firm operated a facility in China that put together a product from parts made in either China, the United States, or another country

-direct sales of products manufactured in the United States or a third country.

Most of the firms (73%) in this study engaged in direct sales. This figure is somewhat above the norm for American businesses active in China. (See Chart 3.)

Table 2

FUTURE OUTLOOK

(percent of firms)

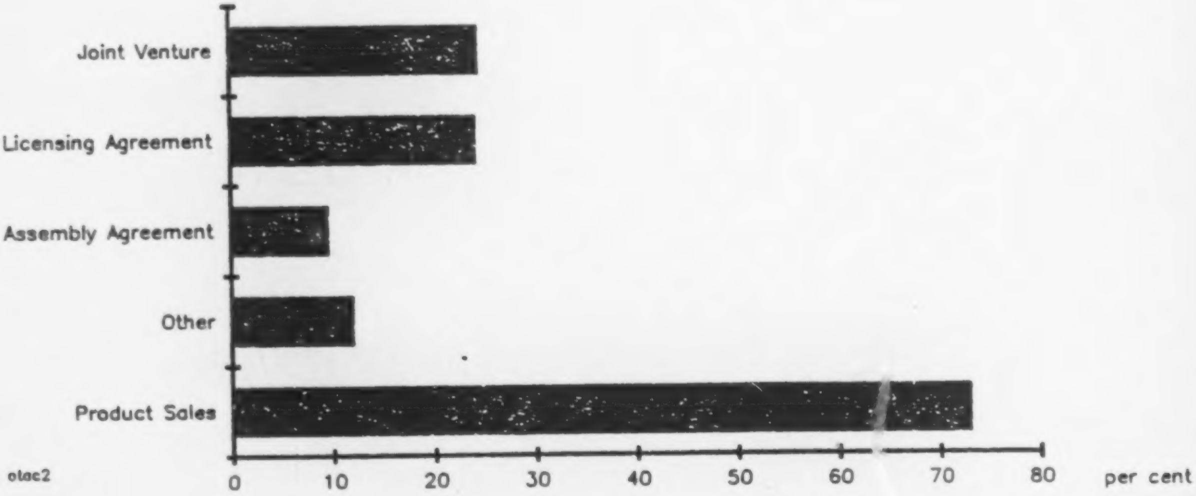
	Small Firms	Large Firms	All Firms
Only a couple of transactions--unlikely to be repeated	11.5	6.7	9.8
Likely to continue at its present level	19.2	6.7	14.6
Likely to increase in the future	50.0	60.0	53.7
Don't know	11.5	20.0	14.6

Question 2: Which of the following characteristics apply to your China business?

tab2

CHART 3

MOST FIRMS ARE ENGAGED IN DIRECT PRODUCT SALES



Size of the Firm and Nature of Business Activity

Most of the firms were not simply "dabblers" in the international market. The typical (median) firm in this study derived about 25-30% of its total revenue from overseas activity in general. Over a quarter of the firms derived more than 30% of their revenues from international business activity. When measured in terms of percentage of revenues, the *small* firms tended to be more heavily involved in international activity than large firms. (See Chart 4 and Chart 5.)

Similarly, firm size was related to the kinds of activities undertaken in the new China market. Small firms concentrated most of their efforts on the direct sale of products and services. Larger firms engage more often in joint venture relationships, assembly operations, and licensing agreements. (See Chart 6.)

TRANSFERRING TECHNOLOGY: HOW FIRMS SEE THEMSELVES

Business people are not in agreement about what constitutes a transfer of technology. Does it occur with the shipment of hardware such as equipment, machinery, or scientific apparatus? Or is technology transferred when software--knowledge, formulae, and organizational strategies--are transmitted?

Most of the respondents indicated that their firms were engaged in the transfer of technology as part of the normal course of their business activity in China. These firms perceive of themselves as transferring technology to China in a variety of ways:

CHART 4

A HIGH PERCENTAGE OF REVENUES COMES FROM EXPORT EARNINGS

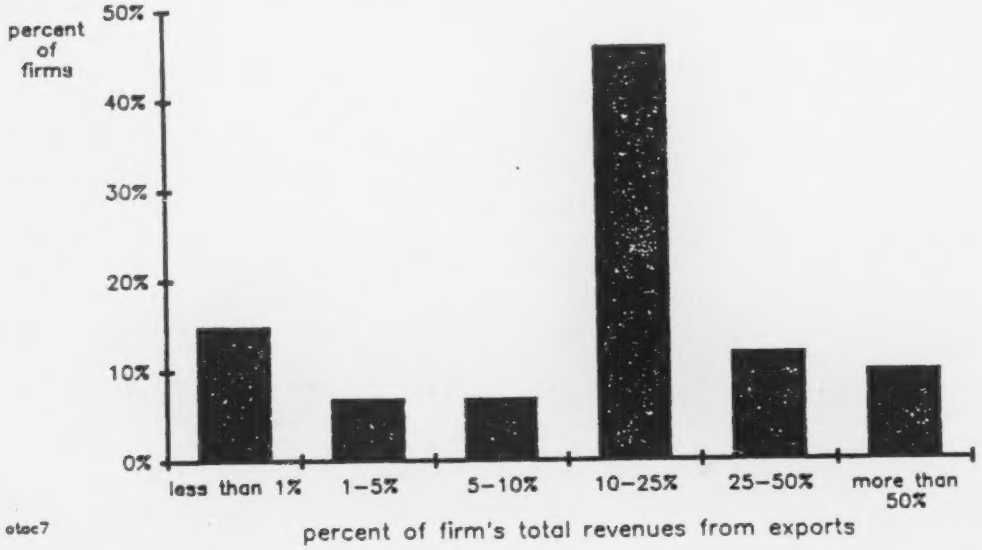


CHART 5

SMALL FIRMS DERIVE MORE OF THEIR REVENUES FROM EXPORTS THAN DO LARGE FIRMS

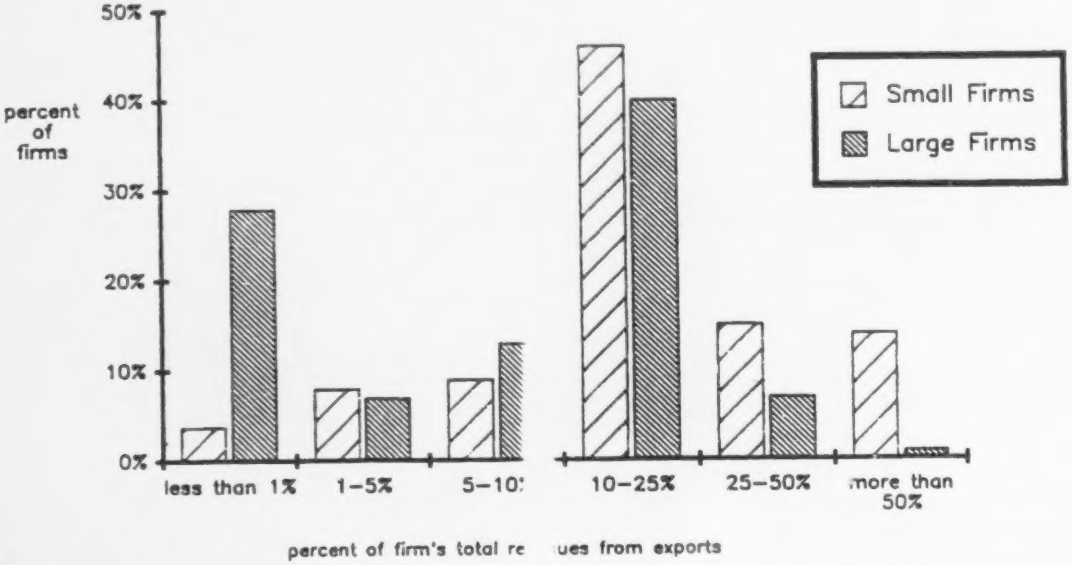


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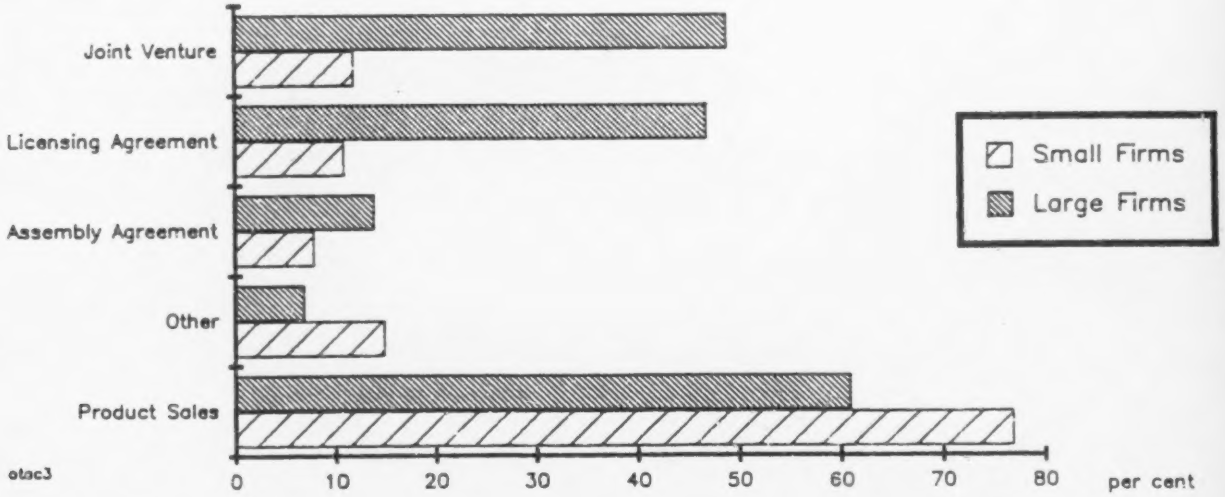
CHART 6

LARGE FIRMS ARE INVOLVED IN MORE JOINT VENTURES AND LICENSING AGREEMENTS



-Respondents from small firms tended to believe that they transferred technology primarily through the sale of the product itself. (See Table 3.)

-Respondents from large firms believed that their transfers of technology occurred more often as a result of licensing agreements, training sessions, and the working out of details during the formulation of proposals.

Clearly some of the differences between large and small firms reflect the resources possessed by the firms themselves. Large firms usually have greater depth of knowledge, scientific skills, and management expertise that make the more intangible sorts of technology transfer possible. They also have larger staffs, more complex divisions of labor, longer experience in training, and a greater ability to absorb indirect costs during the initial phases of a new venture.

But a part of the reported difference about the kinds of technology transferred by large and small firms results from perception. Because small firms are more concerned with direct sales, they often fail to appreciate the immense amount of knowledge they are covering in preliminary work sessions. One representative of a small firm, for example, at first argued that he transferred technology only with the delivery of his product--a quality control testing system. But as he talked about the steps that he had moved through in making his sale--discussions, sessions in the Chinese end user's factory, working with Chinese engineers on final specifications--he finally concluded that he had transferred more knowledge in the working out of his final deal than he did with the shipment of the equipment itself.

Table 3

METHODS OF TECHNOLOGY TRANSFER

(percent of firms)

	Small Firms	Large Firms	All Firms
Sale, lease, or lending of equipment	81.0%	55.6	65.9
Training	38.1	50.0	41.5
Transfer of technical knowledge during presentations/proposals	42.9	33.3	36.6
Licensing of technology and proprietary information	14.3	38.9	24.4
Joint ventures	14.3	38.9	24.4
Direct sale of technical information	7.5	22.2	14.6
Co-production	4.8	22.2	12.2
Other	0.0	5.6	4.9

Question 3: Which of the following ways of transferring technology, expertise, and/or scientific information have you used in your China venture?

tab3

Similarly, small firms, with their more limited definition of "technology transfer," tend to believe that such transfers are relatively unimportant in the completion of a final business relationship. As one small businessman argued, "They needed my product, I wanted to sell it, we signed a contract. All they had to know was how to start the motor." (See Chart 7.)

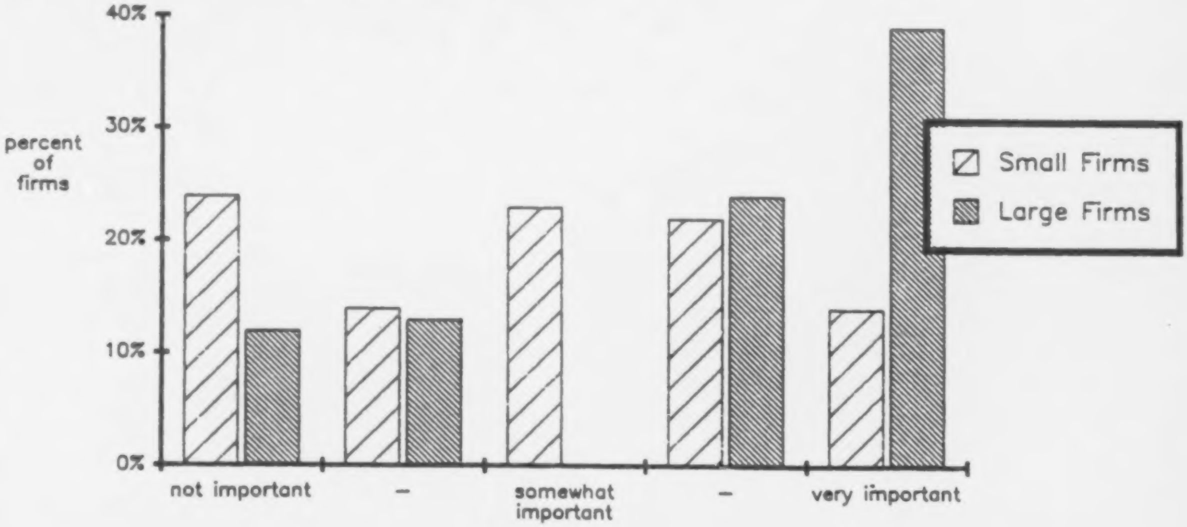
When later pressed on this point, however, the businessman described the process by which he actually made the sale. It involved a series of meetings not only with the actual end users of his machines, but also with several groups of engineers from Chinese enterprises that supplied raw materials to the purchaser's factory. These engineers were concerned about the ways the new machinery would alter the demands placed on their own delivery capabilities, and they spent several sessions working through the equipment's new requirements with the American businessman. Clearly some important knowledge was transmitted during these sessions.

Large firms, on the other hand, are much more aware of the role that knowledge plays in the actual completion of their business arrangements. The most sophisticated of these firms capitalize on their ability to convey knowledge. One businessman from a large firm said, "My boss thinks that we are selling equipment to China, and indeed we are. But to make these sales, I take along some of my best product engineers. With these engineers, I can get in the front door of any factory in China."

Interestingly, as many studies of business activity in other parts of the world have shown, the respondents from large firms tended to

CHART 7

LARGE FIRMS BELIEVE TRANSFERRING TECHNOLOGY IS IMPORTANT IN COMPLETING SALES



QUESTION 5: Some companies have found the transfer of technology very important to the completion of their sale. How important was it to you?

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VIEW THE TECHNOLOGIES THEY TRANSFERRED TO CHINA DIFFERENTLY FROM THE RESPONDENTS FROM SMALL FIRMS. RESPONDENTS FROM LARGE FIRMS TENDED TO BELIEVE THAT THE TECHNOLOGY THEY SENT TO CHINA WAS COMPARABLE TO THAT WHICH THEY TRANSFERRED ELSEWHERE. RESPONDENTS FROM SMALL FIRMS TENDED TO BELIEVE THAT THE TECHNOLOGY THEY TRANSFERRED TO CHINA WAS NOT THE EQUAL OF THAT WHICH THEY MIGHT SUPPLY OTHER MARKETS. (SEE CHART 8.)

SUCCESSFUL FIRMS IN CHINA: SOME OF THE FACTORS INVOLVED

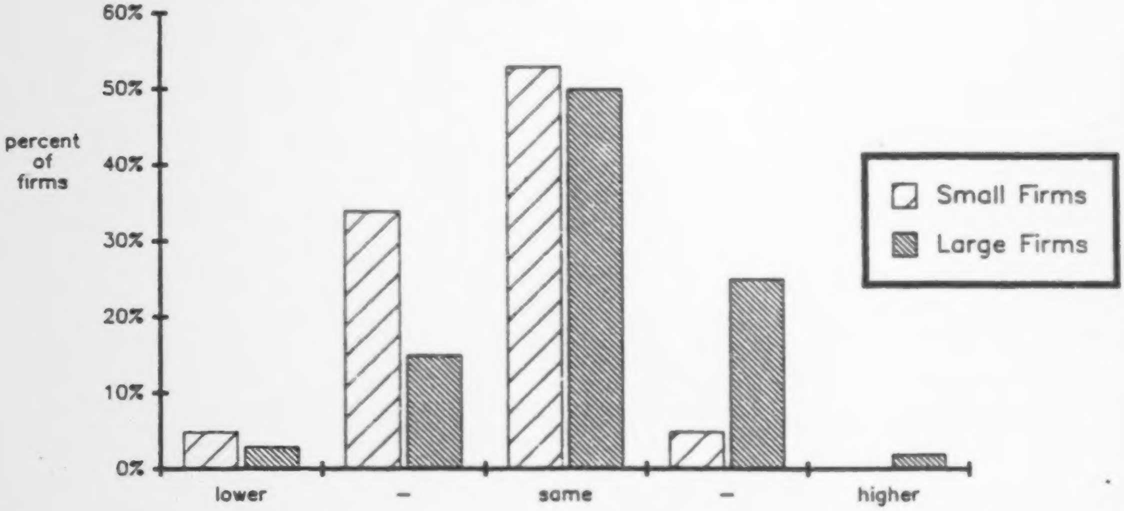
THE PICTURE OF THE ROLE THAT TECHNOLOGY TRANSFERS PLAY IN AMERICAN BUSINESS ACTIVITY IN CHINA THAT EMERGES FROM THIS PROJECT IS ONE THAT SHOWS THAT LARGE AND SMALL FIRMS ARE BOTH SIMILAR AND DIFFERENT. THE SIMILARITIES BETWEEN LARGE AND SMALL FIRMS COME FROM THE FACTORS THAT DRAW THEM TO THIS MARKET IN THE FIRST PLACE: MARKET SIZE, GROWTH POTENTIAL, AND A COMMITMENT TO INTERNATIONAL BUSINESS ACTIVITY IN GENERAL. THE FACTORS THAT SEPARATE LARGE FIRMS FROM THEIR SMALLER COUNTERPARTS INCLUDE DIFFERENCES IN GOALS, WITH SMALLER FIRMS MORE INVOLVED DIRECT SALES AND LARGER FIRMS INVOLVED IN MORE INTANGIBLE FORMS OF TECHNOLOGY TRANSFER. THEY ALSO DIFFER IN HOW THEY VIEW THE TECHNOLOGY THEY ARE TRANSFERRING.

BEYOND THESE BASIC DIFFERENCES, HOWEVER, THERE ARE SOME IMPORTANT FACTORS THAT SEPARATE SUCCESSFUL AND UNSUCCESSFUL VENTURES IN CHINA. I HAVE SHOWN IN OTHER STUDIES THAT DIFFERENT ORGANIZATIONAL QUALITIES AND OPERATING STRATEGIES DISTINGUISH THE SUCCESSFUL FIRMS IN THE NEW CHINA MARKET FROM THE UNSUCCESSFUL.

SOME ORGANIZATIONAL FACTORS RESPONSIBLE FOR SUCCESS INCLUDE THE FOLLOWING:

CHART 8

LARGE FIRMS BELIEVE THEY ARE TRANSFERRING SOPHISTICATED TECHNOLOGY TO CHINA



QUESTION 6: How does the level of sophistication of the technology of your exports to China compare to those typical of your company sales in general?

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- A FLEXIBLE PRODUCTION TECHNOLOGY THAT ALLOWS FIRMS TO ADJUST THEIR PRODUCTION SCHEDULES TO RAPIDLY CHANGING CHINESE NEEDS.

- A LONG-TERM PERSPECTIVE THAT ALLOWS A FIRM TO DEVELOP SOUND WORKING RELATIONSHIPS WITH POTENTIAL CHINESE END USERS.

- A DYNAMIC PATTERN OF GROWTH THAT MAKES A FIRM MORE CONFIDENT OF ITS ABILITY TO MOVE INTO NEW AREAS AND, HENCE, LESS FEARFUL THAT THE TECHNOLOGY TRANSFERRED TO CHINA MAY SOMEDAY COME BACK TO HAUNT AND COMPETE WITH THE SUPPLIER.

SOME OF THE MOST IMPORTANT OPERATING STRATEGIES FOR SUCCESSFUL FIRMS INCLUDE THE FOLLOWING:

- UNDERTAKING A DETAILED MARKETING ANALYSIS BEFORE ENTERING THE NEW CHINA MARKET.

- ORGANIZING A PROJECT TEAM THAT CAN BOTH NEGOTIATE WITH CHINESE END USERS AND MAINTAIN A STRONG LIAISON WITH RELEVANT UNITS IN THE HOME OFFICE.

- CREATING AN OPERATIONAL PLAN THAT IS EXPLICIT ABOUT SUCH FACTORS AS NEEDED LEVELS OF PROFITABILITY, THE POTENTIAL FOR FUTURE MARKET GROWTH, AND THE SORT OF "NICHE" THE FIRM IS SEEKING TO FILL.

- DEVELOPING IN-HOUSE ASIA EXPERTISE THAT ALLOWS A FIRM TO ANALYZE THE CHINA MARKET ITSELF, IN TERMS OF ITS OWN CRITERIA.

THERE ARE CLEAR REASONS WHY SOME FIRMS' DEVELOP THE OPERATIONAL AND ORGANIZATIONAL QUALITIES THAT LEAD TO SUCCESS IN THE NEW CHINA MARKET. SOME OF THESE REASONS ARE RELATED TO:

-THE INFRASTRUCTURE OF THE FIRM

-STAFF DEPTH IN EXPORT-RELATED ACTIVITIES

-ON-GOING DEVELOPMENT OF NEW PRODUCT OR PROCESS TECHNOLOGIES.

-DEPARTMENTAL RELATIONSHIPS WITHIN THE FIRM

-FINANCIAL UNDERPINNINGS OF THE FIRM

-INTRA-FIRM OPPORTUNITIES FOR ENTREPRENEURIAL ACTIVITY

-LEADERSHIP ARRANGEMENTS WITHIN THE FIRM

-THE PROCESSES BY WHICH NEW CORPORATE STRATEGIES COME ABOUT

-UNDERLYING CORPORATE CULTURE

-ATTITUDES TOWARD RISK.

PART II

PROBLEMS OF DOING BUSINESS IN CHINA

The problems involved in conducting business in China are legendary, and most of these problems have been well-described in other studies and reports. First-time-in-China business people speak of the unexpected complexity of their negotiations, the insatiable desire on the part of Chinese end users for knowledge, the costs of doing business, the impenetrable Chinese bureaucracy, the tangle of rules and regulations on both the Chinese and American sides.

The survey questionnaire and interviews asked business people to address their concerns about some of these problems. The survey focused on the following: First negotiations between American business people and their Chinese customers; avenues for finding adequate sources of information about the new China market; and the ways that business people work with American governmental agencies and programs at the national and local level.

FIRST NEGOTIATIONS WITH CHINESE CUSTOMERS

The tales that American business people tell of their first China excursions are predictable and amusing. Many speak of their inability to face yet one more dinner with a sea-slug entree, of their awkwardness during the ritual "bottoms-up" exercises, of their fumbling with various national and cultural sensibilities. For most business people, however, their main concerns center on first negotiations with potential Chinese customers.

Negotiating an entry into a new market is problematic in any country, and China is no exception. But most of the business people in this survey were unprepared for the complexity and lengthiness of their first China negotiations. Most firms--even those with substantial experience in other parts of the world--tended to underestimate the amount of time required to close their first agreements. It takes time for business people to become familiar with the dynamics of Chinese negotiating teams--the ways these teams relate to the complex set of bureaucracies and agencies that give the teams their mandate, as well as the different styles of discussion and interaction. This survey shows that even firms with substantial experience in other foreign markets had trouble with their first China negotiations and time schedules.

Surprisingly, the length of time required for this first negotiation, while not as short as most firms expected, was not of the "years and years" duration often mentioned by the media. On the average, firms expected to take about 8 months negotiating their first

AGREEMENT; THEIR ACTUAL TIME WAS APPROXIMATELY 13 MONTHS--WHICH IS A LONG TIME, BUT NOT EXCESSIVE BY INTERNATIONAL STANDARDS. (SEE TABLE 4.)

NEGOTIATING TECHNOLOGY TRANSFERS

AMERICAN BUSINESS PEOPLE ALMOST UNIVERSALLY COMMENT ABOUT THE CHINESE THIRST FOR KNOWLEDGE. AS ONE BUSINESSMAN STATED, "THEY WOULD RATHER HAVE MY BLUE PRINTS THAN ALMOST ANY PLEASURE OF THE FLESH."

ALTHOUGH BUSINESS PEOPLE--ESPECIALLY THOSE FROM LARGE FIRMS--SEE THE TRANSFER OF TECHNOLOGY AS A VITAL PART OF THEIR OPERATIONS IN CHINA, THESE TRANSFERS ARE NOT WITHOUT PROBLEMS. RESPONDENTS TO THE SURVEY INDICATED THAT TECHNOLOGY TRANSFER PROBLEMS ARE AMONG THE THORNIEST THEY FACE AND OFTEN INTRUDE ON THE NEGOTIATION PROCESS ITSELF.

THE SEVEN PROBLEMS MENTIONED MOST FREQUENTLY BY AMERICAN BUSINESS PEOPLE INVOLVED IN TECHNOLOGY TRANSFER ISSUES ARE:

- BUREAUCRATIC AND ORGANIZATIONAL PROBLEMS. BUSINESS PEOPLE SPEAK OF THE SOMETIMES AWKWARD "MESH" BETWEEN THEIR OWN FIRM AND THAT OF THE CHINESE RECIPIENT OF TECHNOLOGY. AMERICANS ARE OFTEN UNPREPARED FOR THE FACT THAT THEIR CHINESE CUSTOMERS LIVE IN A COMPLEX FLOW OF GOODS AND SERVICES FROM "UPSTREAM SUPPLIERS" AND "DOWNSTREAM CONSUMERS." THE TIME REQUIRED FOR A CHINESE END USER TO ADJUST A NEW TECHNOLOGY TO THE REQUIREMENTS OF UPSTREAM AND DOWNSTREAM CONSTITUENCIES IS SEEN

Table 4

NEGOTIATING IN CHINA

Time required between initial inquiries by American firms and beginning to do business

(percent of firms)

	Expected amount of time	Actual amount of time
3 months	5.3%	0.0
6 months	21.1	18.9
1 year	28.9	32.4
2 years	31.6	13.5
3 years or more	13.2	15.1

Question 13: How much time had you *expected* to invest between initial inquiries and beginning to do business?

Question 14: How much time was *actually* required between initial inquiries and beginning to do business?

tab4

BY MANY AMERICANS AS ANOTHER FORM OF CHINESE BUREAUCRATIC ENTANGLEMENT.

-FINANCIAL AND CURRENCY ISSUES. AMERICAN BUSINESS PEOPLE ARE CERTAINLY AWARE OF THE LEGENDARY PROBLEMS INVOLVED IN MOVING CAPITAL IN AND OUT OF CHINA. BUT MOST OF THE BUSINESS PEOPLE INVOLVED IN THIS PROJECT HAD FOUND THEIR WAY THROUGH THESE PROBLEMS. ABOUT A THIRD OF THE RESPONDENTS, HOWEVER, STILL REPORTED SIGNIFICANT PROBLEMS IN THE FLOW OF MONEY. IN THESE LATTER CASES, ONE OF TWO PROBLEMS WAS REPORTED: (1) THERE HAD BEEN DELAYS IN WORKING OUT PROCEDURAL ARRANGEMENTS, USUALLY THE RESULT OF NOT HAVING DEALT WITH THE CORRECT CHINESE AGENCIES AND OFFICES; AND (2) THERE HAD BEEN HURDLES INVOLVING THE TRANSFER OF LARGE AMOUNTS OF CURRENCY, WHICH USUALLY RESULTED FROM HAVING RUN AFOUL OF AN UNKNOWN PROCEDURE REQUIRED BY ONE OF THE CENTRAL FINANCIAL INSTITUTIONS.

-LEARNING PROBLEMS. ABOUT ONE QUARTER OF THE AMERICAN FIRMS REPORTED THAT THE END USERS OF THEIR TECHNOLOGIES HAD DIFFICULTY ABSORBING THE NEW TECHNOLOGIES. SOME CHINESE RECIPIENTS SIMPLY HAD DIFFICULTIES IN LEARNING NEW PROCEDURES--THEIR LEVEL OF EDUCATION AND TECHNICAL SOPHISTICATION SIMPLY WAS NOT ADEQUATE FOR THE DEMANDS OF THE NEW METHODOLOGIES; (2) OTHER CHINESE RECIPIENTS RESISTED THE NEW TECHNOLOGIES; THEY WERE UNPREPARED TO MAKE THE ORGANIZATIONAL AND PERSONAL CHANGES THAT WERE REQUIRED.

-NEGOTIATION ISSUES. THE WAY THAT CHINESE END USERS NEGOTIATE TECHNOLOGY TRANSFERS REMAINS A DIFFICULT HURDLE FOR MANY

American firms. Newcomers to the China market have trouble adjusting to the "negotiation within a negotiation" character of the Chinese bargaining session.

-Problems of Time. Also considerable are problems of time. Because working in China can be so very expensive, and because most American negotiators often have other projects that also require their attention, many business people report that they must take into account two kinds of time: "theirs and ours."

-Proprietary Information. The lack of a solid understanding by many Chinese of "information ownership" issues still perplexes many American business people. One businessman reported that on returning to China a year after his project had been completed, he saw the laminating process that had been part of the original contract used in three other Chinese factories. When he questioned his original Chinese contact on the issue, the reply was that "machines can be owned, but knowledge belongs to everyone."

-Communication Problems. Finding a common language remains a problem--some concepts important to American business are still alien to Chinese enterprises. This seems more true for American lawyers and managers than for engineers and technical experts whose language is more truly international. (See Table 5.)

Table 5

PROBLEMS IN NEGOTIATING TECHNOLOGY TRANSFERS

(percent of firms experiencing problem)

Problems of time; delays	24%
Financial and currency issues	33%
Communication problems--technical and cultural	12%
Learning, teaching, assimilation problems	26%
Proprietary information questions	16%
Bureaucratic and organizational problems	36%
Negotiation and strategy issues	25%

Question #4: With reference to your answer in Question #3 (on ways of transferring technology) what problems, if any, were encountered during these transfers?

tab15

THE NEED FOR USEFUL INFORMATION ABOUT CHINA

Above all else, our respondents wanted more information about China. Knowledge, our respondents indicated over and over, was their great need in entering the uncharted waters of the new China market.

Respondents were quite specific about the sorts of information they needed for their China business ventures. As Table 6 indicates, firms believed that the kinds of information they needed BEFORE entering the China market was different from that which they needed AFTER entering it.

The following was seen as most important to know BEFORE entry into the China market:

-The end users need for products and technology. American business people almost universally feel a need to pinpoint China's needs more effectively. Most business people begin their China ventures either by working the "Beijing ministry circuit" or by relying on whom-do-you-know contacts.

Those businesses relying on the Beijing ministry circuit as their primary point of entry into the new China market almost all report a high degree of frustration. (The exceptions are those firms trying to nail down participation in one of China's large-scale projects. Here the role of the central ministries is crucial.) For most sales and for most technology transfers, however, the key to completing a business deal is in finding the actual end user--the Chinese enterprise,

Table 6

USEFUL INFORMATION ABOUT CHINA

Types of information firms have found useful in their China ventures

(percent of firms)

	Small Firms		Large Firms	
	before	after	before	after
	entering		entering	
China's needs for products and technology	76.2%	58.8	88.9	61.1
Particular end-users of your product	52.4	57.1	38.9	61.1
Chinese decision-making	19.0	52.4	27.8	66.7
Chinese law and practices	9.5	38.1	33.3	61.1
China's ability to purchase equipment from abroad	38.1	42.9	27.2	50.0
Competition	38.1	33.3	27.8	61.1
Likely market share	14.3	23.8	0.0	50.0
Labor costs	4.8	0.0	16.7	38.9
Availability of raw materials	9.5	9.5	16.7	27.8
U.S. law and regulations	33.3	19.0	55.6	44.4
U.S. governmental assistance for exports	23.8	23.8	33.3	16.7

Question 18: in preparing to enter the China market was the following information readily available to your company?

Question 19: Which of the following categories of information did you find important after entering the China market?

tab7

INSTITUTE, OR DISTRIBUTION SYSTEM THAT WILL ACTUALLY EMPLOY THE PRODUCT OR TECHNOLOGY.

Most American business people still have trouble locating such end users directly, and the large ministries are seldom any great help. Many American businesses subsequently turn for advice to agents (often in Hong Kong) and consultants who seem to have "contacts" in one area or another.

One of the real information needs in the new China market involves the identification of these actual end users. Who are they? What do they need? What sorts of bureaucratic relationships are they involved in?

The following were seen as most important to know after entry into the China market:

-Chinese decision-making. Many business people discover all too late that a letter of intent, or even a contract, is no guarantee that their project will be consummated. Business people have two problems in this regard: (1) They have trouble distinguishing between Chinese processes of deciding about new technologies and Chinese processes for ratifying such decisions; and (2) They fail to see the actual end user of their product or technology within the context of upstream suppliers and downstream consumers.

-Chinese law and practices. The Chinese legal system, like legal systems everywhere, is complex and multi-tiered. Chinese commercial law is still in its infancy. Business people often

FIND--ONCE THEY ARE ON THE CHINESE SCENE--THAT THEY NEED MUCH MORE ADVICE ABOUT HOW THE DIFFERENT LEVELS OF CHINESE COMMERCIAL LAW (NATIONAL, PROVINCIAL, LOCAL) RELATE TO ONE ANOTHER. THEY ALSO NEED MORE INFORMATION ABOUT REGIONAL VARIATIONS--TOO MANY BUSINESS PEOPLE HAVE COME TO GRIPS WITH REGULATIONS IN ONE PROVINCE ONLY TO ASSUME, INCORRECTLY, THAT THE SAME RULES AND PROCEDURES HOLD TRUE FOR THE PROVINCE NEXT DOOR.

-CHINA'S ABILITY TO PURCHASE EQUIPMENT FROM ABROAD. AMERICAN BUSINESS PEOPLE REPORT ALMOST UNIVERSAL FRUSTRATION ABOUT THEIR ABILITY TO BRING EQUIPMENT AND MATERIALS IN FROM ABROAD, AND EXPATRIATE EARNED INCOME. HERE, AS IN OTHER AREAS, BUSINESS PEOPLE NEED MORE INFORMATION ABOUT THE CROSS-CUTTING NATURE OF THE CHINESE AGENCIES AND BUREAUCRACIES THAT AFFECT THESE PROCEDURES. ONE BUSINESSMAN WITH A SIGNED AGREEMENT IN HIS HAND FROM A BEIJING MINISTRY, WAS CHAGRINNED TO DISCOVER THAT HE STILL NEEDED TO INTERACT WITH A SERIES OF PROVINCIAL AND MUNICIPAL-LEVEL TRANSPORTATION OFFICES BEFORE ANY MATERIALS COULD BE SHIPPED TO HIS PROJECT.

-COMPETITION AND MARKET SHARE. AMERICAN FIRMS ARE DISCOVERING THAT THERE IS ALREADY KEEN COMPETITION ON THE CHINA SCENE FROM OTHER COUNTRIES. THE COMPETITION IS SEEN AS COMING FROM THREE AREAS: LARGE EUROPEAN INDUSTRIAL COMBINES; JAPANESE CORPORATE GROUPS AND TRADING COMPANIES; AND THIRD WORLD MULTINATIONALS, ESPECIALLY THOSE FROM SOUTHEAST ASIA. AMERICAN BUSINESS PEOPLE LOOK CONSTANTLY FOR INFORMATION ABOUT THEIR COMPETITION. THEY

MOST WISH THAT THEY KNEW THE NAMES OF THEIR COMPETITORS AS WELL AS THE STRATEGIES AND RESOURCES AVAILABLE TO THEM.

LARGE FIRMS DIFFER FROM SMALL FIRMS NOT ONLY IN THEIR RELATIVELY GREATER DESIRE FOR MORE INFORMATION ABOUT THE CHINA MARKET AFTER THEY ENTER IT. THEY ALSO DIFFER FROM THEIR SMALLER COUNTERPARTS IN WISHING FOR DIFFERENT KINDS OF INFORMATION.

PROBLEMS WITH INFORMATION SOURCES

WHERE TO GET THIS INFORMATION? BUSINESSES CONTACTED A NUMBER OF DIFFERENT SOURCES IN THEIR SEARCH FOR INFORMATION ABOUT THE NEW CHINA MARKET. ULTIMATELY, MOST OF THESE SOURCES PROVED TO BE DISAPPOINTING TO THE RESPONDENTS. (SEE TABLE 7 AND CHART 9.)

SEVERAL SOURCES OF INFORMATION STOOD OUT CONSISTENTLY IN OUR RESPONDENTS' VIEWS:

- THE NATIONAL COUNCIL ON U.S.-CHINA TRADE GOT HIGH MARKS FROM THE FIRMS PARTICIPATING IN THIS STUDY. THE COUNCIL HAS A REPUTATION FOR RELIABILITY, AND THEIR INFORMATION HAS BEEN TERMED "CLEAN" AND "INVALUABLE." ONE BUSINESS PERSON STATED, "THEY ARE ALWAYS THERE WHEN I NEED THEM. I HAVE HAD REPORTS SENT TO ME, CONSULTATIONS COMPLETED MORE QUICKLY THAN WITH ANY OF THE LARGE CONSULTING FIRMS, AND INTRODUCTIONS MADE IN BEIJING. IF THERE WERE JUST ONE AGENCY I WOULD CONSULT, THIS WOULD BE THE ONE."

Table 7

SOURCES USED TO GATHER INFORMATION ABOUT CHINA

(percent of firms using these sources)

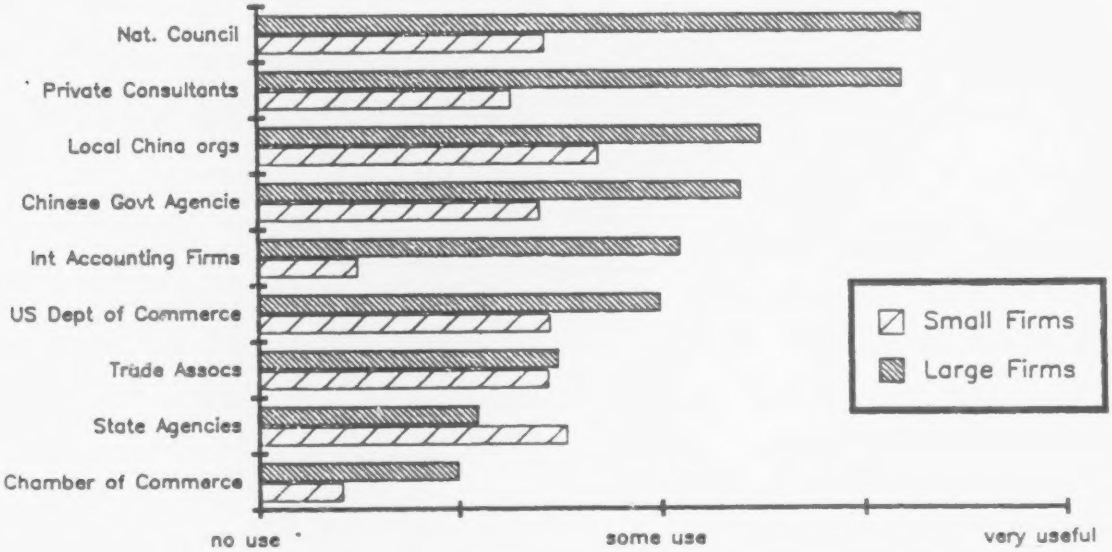
	Small firms	Large firms	All firms
U.S. Dept. of Commerce	61.9%	72.2	63.4
National Council U.S.-China Trade	42.9	71.4	53.6
Private consultants	52.4	61.1	53.6
State agencies	52.4	53.6	51.2
Chinese govt. agencies	57.1	50.0	51.2
Trade associations	52.4	44.4	46.3
Regional/local China orgs.	47.6	55.6	48.7
Chamber of Commerce	33.3	28.9	34.1
International accounting firms	28.6	30.9	31.7
Other	13.8	5.6	7.3

Question 20: Check the sources you used and evaluate the usefulness (accurate, timely, specific) of the information they supplied.

tab8

CHART 9

FIRMS FIND NON-GOVERNMENT INFORMATION SOURCES MOST USEFUL



QUESTION 20: Check the sources you used and evaluate the usefulness (accurate, timely, specific) of the information they supplied.

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-*Private Consultants* were described both in very positive terms and in very negative terms. Business people almost universally claim that what they receive for their five and six figure payments are "telephone book" compendia of information. "At least," said one businessman, "with that study on my shelf, I can cover my a__ if anything goes wrong. But it certainly didn't help me in China."

Firms that were most pleased with their consultants tended (1) to rely on them most heavily in the project-design phase of a new China venture; and (2) to use them as adjuncts to experts *inside* the firm who could channel the consultant's efforts.

-*Regional China Resource Organizations* were relied on by many American firms, especially those whose headquarters were located in the Midwest. One businessman stated, "I know that the National Council is superb. But it's great to have an organization right here, with someone in charge whom I know." Generally, *small* businesses find local China resource organizations the most useful. This may be due, in part, that small firms are sometimes ignored by the National Council and large government agencies. One business person commented, "I do under $10 million a year in total sales. They give me about thirty seconds on the phone in Washington."

-*Chinese government agencies* were surprisingly helpful to American firms in China. One general rule seemed to apply in these relationships: the *lower* the Chinese government agency (and, hence, the closer the agency to the actual end users of

AN AMERICAN PRODUCT OR SERVICE) THE MORE USEFUL THE AGENCY TO THE AMERICAN FIRM.

-THE U.S. DEPARTMENT OF COMMERCE HAS THE HONOR OF BEING THE MOST-CONSULTED AND THE LEAST APPRECIATED SOURCE OF INFORMATION ABOUT CHINA. BUSINESS PEOPLE REPORT REAL FRUSTRATION WHEN DEALING WITH THIS DEPARTMENT. "TOO BIG," SAID ONE. "TOO IMPERSONAL," SAID ANOTHER. "TOO HIGH-HANDED" SAID A THIRD. "THEY ACT AS IF THEY ARE DOING ME A FAVOR JUST TO TALK A FEW MINUTES. I HAVE BETTER THINGS TO DO WITH MY TIME THAN LISTEN TO A YOUNG, CONDESCENDING BUREAUCRAT."

-STATE GOVERNMENT AGENCIES HAVE AN IMPORTANT ROLE TO PLAY IN THE ACTIVITIES OF FIRMS INVOLVED IN ASIA-PACIFIC TRADE. BUT MOST OF THESE STATE TRADE OFFICES HAVE YET TO REALIZE THAT ROLE. ONE BUSINESS PERSON STATED, "MY GOVERNOR SEEMS TO WANT TO TAKE THE PLACE OF MY HONG KONG REPRESENTATIVE--ALL HE'S INTERESTED IN IS SIGNING LETTERS OF INTENT." MOST BUSINESS PEOPLE HAVE STRONG IDEAS ABOUT THE ROLE THEY WOULD LIKE TO SEE STATE TRADE OFFICES PLAY. ONE SUMMED UP THESE ATTITUDES SUCCINCTLY WHEN HE SAID, "THEY SHOULD PROVIDE SOURCES OF INFORMATION--LAWYERS, CONSULTANTS, OR ACADEMICS WHO KNOW ABOUT CHINA--AND HELP ME FIND THE RIGHT OFFICES IN NEW YORK AND WASHINGTON. PERHAPS THEY CAN SHOW THE FLAG WITH AN OCCASIONAL TRIP. BUT I CAN NEGOTIATE MY OWN CONTRACTS, THANK YOU."

THE STATE PROGRAMS MOST OFTEN CITED FAVORABLY BY BUSINESS PEOPLE ARE IN MASSACHUSETTS, NORTH CAROLINA, TEXAS, AND WASHINGTON.

The American Embassy in China: A Special Problem

One information source was cited so often for its problems as to merit special note. The business people who were interviewed or took part in the roundtable discussion expressed almost universal dismay about the assistance (or lack thereof) from staff at the American Embassy in Beijing and some of the consulates. (Not including Hong Kong.) Business people with international experience in other socialist states spoke glowingly of the help they had received from American Embassy personnel there. One business person, for example, recalled mentioning his problems in making the right connections in Yugoslavia to an embassy attache. On the following day he received a call from the embassy inviting him to cocktails with the appropriate Yugoslav official, and a contract was signed shortly thereafter.

The business people who participated in this study spoke glowingly of American embassy in a number of countries, with general agreement that the best of this help occurred in Yugoslavia, India, and the Soviet Union. But for reasons that are hard to pin down, the embassy staff in China is viewed in a negative light. "More interested in large character posters than in helping me," grumbled one business person. "Much too academic," said another.

THE ROLE OF FEDERAL ASSISTANCE

American business people engage in a love-hate relationship with their government agencies. As more than one analyst of international business activity has noted, business people prize their sense of corporate autonomy and identity while at the same time coveting the protection and assistance that government programs offer.

The respondents in our study demonstrated these ambivalent feelings. Most of the firms participating in the study were leery of those federal programs that cou;d potentially assist their new China ventures. Indeed, most of the firms chose not to avail themselves of any of these programs or the services they provided. (See *Table 8* and *Chart 10*.)

At the same time, most of the respondents had very definite views about the sort of help that government--both national and local--*could* provide a business's international operations, and they were not at all hesitant to express these views.

Those who did avail themselves of federal services commented most favorably on the following:

-*Trade Shows*. Both large and small firms believe that such shows provide important arenas for displaying their wares, learning about new markets, making important contacts. and "pressing the flesh."

-*Bilateral Agreements*. Businessmen frequently comment on problems caused by the absence of a strong bilateral trade agreement between the United States and China. One business person argued, "These agreements provide the *framework* for us to operate within. Without such a framework, negotiating a contract sometimes takes on an Alice-in-Wonderland quality." Comments such as these are heard more frequently in large

Table 8

SOURCES OF FEDERAL ASSISTANCE

(percent of firms actually using each of these programs)

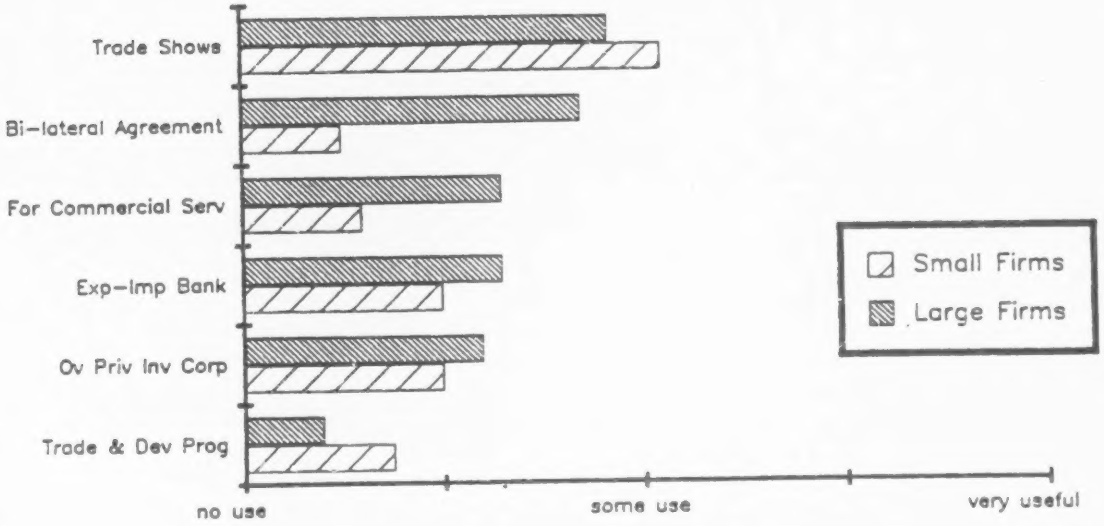
	Small firms	Large firms	All firms
Trade Shows	47.6%	61.1	51.2
Foreign Commercial Service	23.8	44.4	31.7
Export-Import Bank	19.0	33.3	24.3
Bi-Lateral Agreements	19.0	30.7	22.8
Trade & Develop. Program	19.0	27.8	21.9
Overseas Priv. Invest. Corp.	14.3	27.8	19.5
Other	9.5	0.0	2.3

Question 21: Check which of the following Federal activities you have used in your China venture and evaluate their usefulness.

tab9

CHART 10

FEDERAL PROGRAMS ARE NOT SEEN AS IMPORTANT BY MOST FIRMS



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QUESTION 21: Check which of the following Federal activities you have used in your China venture and evaluate their usefulness

FIRMS THAT ARE ACTIVE IN THE CHINA MARKET. TO THE DEGREE THAT SMALLER FIRMS TEND TO BE MORE INVOLVED IN DIRECT SALES, THE ABSENCE OF SUCH AN AGREEMENT DOES NOT CAUSE QUITE THE SAME CONCERN.

-EXPORT-IMPORT BANK. BUSINESS PEOPLE FROM LARGE FIRMS IN PARTICULAR ARGUE ENERGETICALLY FOR A REDIRECTION OF THE BANK'S EFFORTS. SEVERAL PROBLEMS ARE MENTIONED MOST FREQUENTLY: NON-COMPETITIVE RATES OF INTEREST, PROCEDURAL DELAYS, AND A LACK OF A CLEAR STATEMENT OF MISSION.

-OVERSEAS PRIVATE INVESTMENT CORPORATION. THIS ORGANIZATION IS NOT MENTIONED FREQUENTLY BY AMERICAN BUSINESS PEOPLE. BUT THOSE FAMILIAR WITH ITS PROGRAMS TEND APPRAISE THEM ENTHUSIASTICALLY. FOR SMALL BUSINESS PEOPLE, IN PARTICULAR, OPIC PROGRAMS MAKE THE RISK OF A CHINA VENTURE MORE ACCEPTABLE.

THE "BUREAUCRATIC JUNGLE" OF GOVERNMENT REGULATION

NOT UNEXPECTEDLY, THE RESPONDENTS IN THIS SURVEY RESERVED SOME OF THEIR MOST POINTED COMMENTS FOR GOVERNMENT REGULATIONS AND THE AGENCIES THAT OVERSEE THEIR ENFORCEMENT. A SMALL BUT OUTSPOKEN GROUP OF BUSINESS PEOPLE RESPONDING TO THIS SURVEY THAT STATED THAT GOVERNMENT REGULATORY AGENCIES HAVE INTERFERED WITH THEIR CHINA VENTURES TO A SUBSTANTIAL DEGREE. WHILE THIS GROUP WAS NOT LARGE (ABOUT 25% OF THE RESPONDENTS), SOME HIGHLY-CHARGED COMMENTS ABOUT GOVERNMENT AGENCIES--ESPECIALLY

AGENCIES AT THE NATIONAL LEVEL--CAME FROM IT. (SEE TABLES 9 AND 10 AND CHART 11.)

BUSINESS PEOPLE TEND TO BELIEVE THAT EXPORT CONTROL PROCEDURES AFFECT THEIR ABILITY TO COMPETE WITH FIRMS FROM OTHER NATIONS. ONE LARGE FIRM HAS FOUR FULL-TIME PROFESSIONALS AND FIVE SECRETARIES WORKING ON LICENSING REGULATIONS; ANOTHER HAS EIGHT PEOPLE. "IT ALL ADDS ON TO THE COST OF OUR PRODUCTS," ONE EXECUTIVE COMMENTED.

BUSINESS PEOPLE ARE NOT AS CONCERNED WITH THE "DELAY" ASPECT OF THE REGULATORY PROCEDURES AS THEY ARE WITH THE INERTIA THESE PROCEDURES GENERATE, AND THE LACK OF EMPATHY THEY FIND AMONG REGULATORY PERSONNEL. "IT'S A MINDSET," ONE BUSINESS PERSON COMMENTED, "A NEED TO REGULATE FOR THE SHEER SAKE OF REGULATION."

EVERY BUSINESS PERSON HAS TALES TO TELL OF THESE PROCEDURES. ONE REPRESENTATIVE OF A MEDICAL TECHNOLOGY FIRM TOLD OF HIS FRUSTRATING DISCUSSIONS WITH AN OFFICIAL WHO HAD EMBARGOED HIS SHIPMENT BECAUSE OF A SIGNATURE IRREGULARITY. ANOTHER TOLD OF THE FRUSTRATION INVOLVED IN TRYING TO EXPLAIN A COMPLEX TECHNOLOGY TO OFFICIALS WHO DO NOT HAVE THE BACKGROUND TO UNDERSTAND IT OR THE INSIGHT TO JUDGE ITS RELEVANCE TO MILITARY APPLICATIONS.

PROBLEMS WITH FOREIGN COMPETITION

OTHER FOREIGN FIRMS INVOLVED IN CHINA ARE PUSHING AMERICANS HARD. COMPANIES IN THE MITSUI GROUP OR SUMITOMO GROUP, FOR EXAMPLE, SHARE THEIR EXPERTISE IN WAYS THAT GIVE THEM STRONG ADVANTAGES. EUROPEAN FOOD

Table 9

IMPORTANCE OF GOVERNMENT EXPORT CONTROL PROCEDURES

(percent of firms)

Question #23: Have government export control procedures substantially affected your business with China	yes	24%
	no	46
	don't know	14
Question #24: Are you able to get adequate, timely information on the status of your export license applications?	yes	46%
	no	22
	na	32
Question #25: Do export control regulations and their application reflect an adequate understanding of the technology and its military applications?	yes	24%
	no	42
	na	34
Question #27: Is the effort to obtain an export license a significant barrier to exporting?	yes	22%
	no	48
	na	30
Question #26: What fraction of your export licenses for China have gone to CoCom for evaluation?	less than 1%	29%
	1-25%	12
	25-50%	5
	more than 50%	5
	don't know	20
	no answer	29

Table 10

CONSULTANTS AND EXPORT LICENSES

(percent of firms)

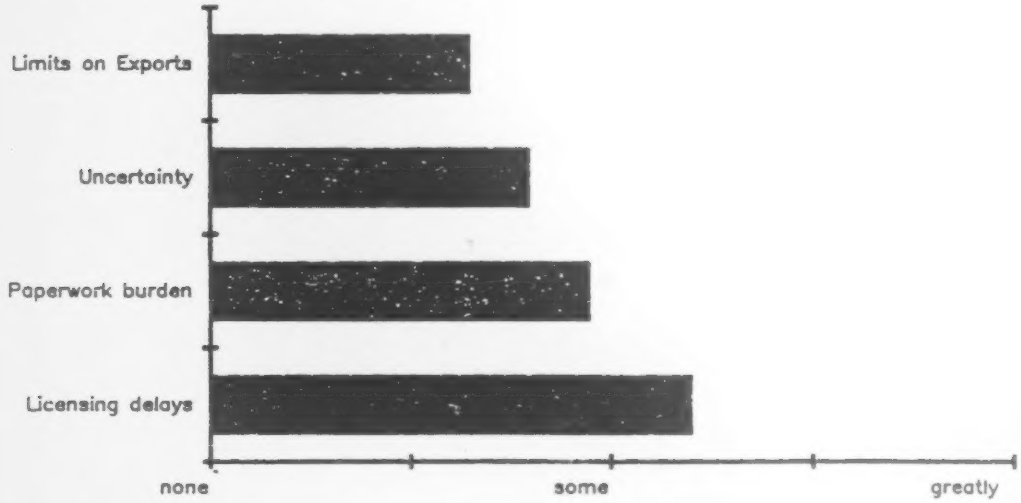
Question #28: Have you used consultants to expidite your China export license applications?	yes	17%
	no	66
	na	17

Question #29: If you have used consultants in your attempts to obtain export licenses to China, have the benefits, in your opinion, outweighed the costs?	yes	12%
	no	6
	na	82

tab12

CHART 11

FIRMS SEE GOVERNMENT DELAYING THEIR EXPORTS WITH LICENSING REGULATIONS AND PAPERWORK



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QUESTION 23: Have government export control procedures substantially affected your business with China?

processing companies and Third World multinationals are also beginning to make their presence felt. American business people see this activity and understand its competitive implications.

While there is no clear view in the American business community about the source of the perceived competitive advantage some foreign firms appear to enjoy, many American business people believe that it has something to do with the way government relates to business in other countries. Other governments, they say, seem to impose fewer restrictions and paperwork, offer more support in terms of direct subventions, and provide greater access to information. Some also argue that other countries' lower labor costs, higher educational standards, or greater willingness to expend resources for research may help account for their competitors' success. (See Table 11.)

THE PERCEIVED ADVANTAGE OF FIRM SIZE

The respondents in this survey believed that one of the major advantages of large size was the ability to maintain full-time representation of some sort in China. This representation sometimes takes the form of a physical office (a door with a nameplate and a secretary) or some sort of surrogate (a consultant or Hong Kong representative).

An on-site representative was seen as important in being able to provide the home company with a continuing source of information about China's changing conditions, evaluating product performance in the new

Table 11

EXPORT CONTROLS AND FOREIGN COMPETITION

(percent of firms)

QUESTION #31: Do your competitors from other countries doing business with China have significantly less difficulty with export controls?	yes	34%
	no	5
	na	61

If yes, which of the following are significant problems:

fewer delays	36%
less paperwork	35
fewer limits on exports	22
less certainty	15
other	7

tab13

MARKET, AND KEEPING THE FIRM'S NAME ACTIVE IN "PROPER CIRCLES." (SEE TABLE 12 AND TABLE 13.)

RESPONDENTS FROM SMALL FIRMS BELIEVED THAT THEIR LACK OF SIZE PLACED THEM AT A RELATIVE DISADVANTAGE. THESE DISADVANTAGES WERE ESPECIALLY NOTICEABLE DURING NEGOTIATION SESSIONS, WHEN SIZE COULD BE TRANSLATED INTO NAME RECOGNITION AND LEVERAGE WITH AMERICAN GOVERNMENT AGENCIES AND OTHER PRIVATE FIRMS.

IN SPITE OF THESE DISADVANTAGES, IT HAS BECOME INCREASINGLY EVIDENT THAT A GREAT NUMBER OF ADVANTAGES ACCRUE TO SMALL FIRMS IN THE NEW CHINA MARKET. AMONG THE MOST IMPORTANT OF THESE ARE:

-GREATER FLEXIBILITY IN MEETING CHINA'S RAPIDLY CHANGING NEEDS

-EASIER AND MORE RAPID DECISION-MAKING PROCESSES

-GREATER ABILITY TO USE NICHE MARKETING TECHNIQUES

-FACTORS OF SCALE THAT MAKE SMALLER SALES MORE FEASIBLE.

INCREASINGLY, IN SPITE OF LIMITED RESOURCES AND SMALL SUPPORT STAFFS, SMALL FIRMS ARE MOVING INTO THE CHINA MARKET. THEY ARE DEVELOPING STRONG RELATIONSHIPS WITH THEIR CHINESE CUSTOMERS, AND THEY ARE MAKING PROFITS. SO STRONG IS THE PRESENCE OF SMALLER FIRMS IN THIS NEW MARKET, IN FACT, THAT SEVERAL ANALYSTS HAVE SUGGESTED THAT DURING THE NEXT SEVERAL YEARS SMALL FIRMS HAVE A MUCH BETTER CHANCE OF SUCCEEDING THAN DO THEIR LARGER COMPETITORS.

Table 12

DISADVANTAGES OF SMALL SIZE

(percent of firms)

	Small firms	Large firms	All firms
Can not afford an office or full-time company representative	81.0	66.7	70.7
No name recognition or leverage in China	57.1	38.9	46.3
Do not have the resources to get information from China	47.6	50.0	46.3
Do not have resources to get information U.S. government or expidite export control process	19.0	16.7	17.1
Other	4.8	5.6	5.0

Question 17: Which of the following are significant disadvantages of a small or moderate size company trying to do business in China?

tab5

Table 13

REPRESENTATION IN CHINA

(percent of firms with offices or representation in China)

		Yes	No
Do you now have an office or representation in China?	Small firms	42.9%	57.1
	Large firms	61.1	38.9
If not, do you plan to have an office or representative in China?	Small firms	25.0	66.7
	Large firms	57.1	42.9

tab6

PART III

ALLEVIATING THE PROBLEMS: RECOMMENDATIONS FROM BUSINESS PEOPLE

There is a myth afloat that American firms can no longer compete in the international market place. "We Have lost our competitive edge," says one academic study. "Americans no longer have the confidence to meet the Japanese challenge," claims a prominent business journal. "American business is interested in making money, not in providing quality services or products," says a major weekly magazine.

Is this true? Not if the experience of American firms in China is any yardstick. To be sure, there have been some prominent failures. Many journalists have shown a particular interest in writing stories of American business people who have felt "burned" by the China market.

But for every loud complaint, there are quiet successes. As has occurred with American companies in the Japan, American business people in China are learning the subtle art of adapting to the conditions of the local market. For firms that are able to adjust, the future is bright. American firms that have prospered in Japan, Korea, and some of the ASEAN nations, after years of carefully developed early efforts, provide examples of the potential payoffs.

Many firms have learned that China is a difficult but not impossible market. As American business people learn about this new market, they are becoming adept at handling the myriad of complex new demands required to survive.

Many of these same business people are also learning something equally important. When asked what he remembered most about his recent negotiation in China, one businessman, after taking a long moment to reflect, replied, "I am tempted to say it was the joy of signing the final contract. But it is really the faces. I spent weeks in that factory, and I've worked hard with their engineers and foremen. Completing the contract was like passing a torch. I've passed on knowledge. None of us will ever be the same again."

I suspect that most American business people, if pushed, would express similar feelings. The transfer of knowledge and skills may be ultimately more satisfying than the completion of contracts and corporate success. Many American business people have learned as well as taught--about China, its people, and some of the deep aspirations that drive the human spirit.

How to do it better? From business people in a number of different forums come a series of common concerns and recommendations:

-Build a framework for trade by having a bi-lateral agreement. Business people believe strongly in the need for an "umbrella" that will give American and Chinese negotiators a common set of rules under which they can operate.

-GIVE PUBLIC FINANCING FOR PRIVATE ORGANIZATIONS TO GATHER MORE INFORMATION. AMERICAN BUSINESS PEOPLE PLEAD FOR MORE INFORMATION OF EVERY SORT: ABOUT CHINESE END USERS, FOREIGN COMPETITION, CHANGING ECONOMIC CONDITIONS, AND TRADE REGULATIONS. BUT MOST BUSINESS PEOPLE SHY AWAY FROM OBTAINING THIS INFORMATION FROM NATIONAL AGENCIES. ONE PARTICULARLY PROVOCATIVE DISCUSSION GENERATED THE IDEA OF PUSHING FOR THE PUBLIC FUNDING OF INFORMATION GATHERING ACTIVITIES ON THE PART OF PRIVATE ORGANIZATIONS SUCH AS THE NATIONAL COUNCIL AND REGIONAL CHINA RESOURCE ORGANIZATIONS.

-MAKE THE GOALS OF EXPORT LICENSING MESH WITH THOSE OF OTHER AGENCIES. IN OBTAINING EXPORT LICENSES, BUSINESS PEOPLE OFTEN FEEL CAUGHT BY THE CONTRADICTORY SIGNALS THAT COME FROM DIFFERENT AGENCIES. "SOME AGENCIES TAKE A FREE-TRADE STANCE, OTHERS WANT TO BLOCK TRADE FOR REASONS OF NATIONAL DEFENSE," SAID ONE BUSINESS PERSON. "THERE ARE TIMES WHEN I FEEL KNOCKED ABOUT LIKE A BILLIARD BALL." AT BASE, MOST BUSINESS PEOPLE YEARN FOR IDEOLOGICAL CONSISTENCY--A UNIFORM AND PREDICTABLE SET OF POLICY GUIDELINES THAT CAN BECOME A BASIS FOR LONG-TERM PLANNING.

-BECOME MORE COMPETITIVE IN WORLD MARKETS BY CHANGING GOVERNMENT FINANCING PROGRAMS. AMERICAN BUSINESS PEOPLE ARGUE FOR MORE FINANCIAL SUPPORT FROM GOVERNMENT AGENCIES. JAPAN, SWEDEN AND GERMANY ARE FREQUENTLY POINTED TO AS COUNTRIES THAT DO EXTEND THIS SORT OF SUPPORT. BUSINESS PEOPLE WANT LOAN

Table 14

WHAT SHOULD GOVERMENT DO?

RECOMMENDATIONS FOR ADDITIONAL GOVERNMENT ASSISTANCE

(percent of firms recommending further help)

	Small firms	Large firms	All firms
Financing	52.4	50.0	48.7
Supplying more info. on the China market to industry	42.9%	55.6	46.3
Foreign aid associated with financing of products	38.1	55.6	43.9
Avoiding protectionism in U.S. markets Chinese products	23.8	50.0	34.1
Providing formal framework for negotiations (e.g. bilateral agreements)	4.8	50.0	24.3
Playing a middleman role between China and U.S. industry	19.0	27.8	21.9
Oversight on China's compliance with agreements such as patents	9.5	38.9	21.9
Feasibility studies	19.0	22.2	19.5

Question 22: What government activities could be expanded that would improve your export competiveness in the China market?

tab10

GUARANTEES, COMPETITIVE INTEREST RATES, AND MORE PREDICTABLE FINANCING.

-UPGRADE THE COMMERCIAL FUNCTIONS OF THE EMBASSY. BUSINESS PEOPLE WHOSE FIRMS ARE ACTIVE IN OTHER AREAS OF THE WORLD EXPRESS THE NEED FOR GREATER EXPERTISE AND EMPATHY IN THE AMERICAN EMBASSY IN BEIJING.

-SUPPORT MORE TRAINING PROGRAMS FOR YOUNG PEOPLE. BUSINESS PEOPLE ARE BECOMING AWARE OF THE NEED FOR EMPLOYEES KNOWLEDGEABLE ABOUT BOTH BUSINESS AND CHINA. THERE IS A NAGGING SENSE ON THE PART OF MANY BUSINESS PEOPLE THAT IT IS PERHAPS TOO LATE FOR THEM TO ACQUIRE ALL OF THE NEEDED SKILLS. BUT MANY COMPANIES ARE BEGINNING TO BUILD A YOUNG CADRE OF BUSINESS AND ASIA SPECIALISTS. "WE NEED THESE YOUNG PEOPLE, AND THEY SIMPLY AREN'T THERE," SAID ONE.

-CHANGE THE TAX REGULATIONS FOR BUSINESS PEOPLE LIVING ABROAD. THERE IS A BELIEF--AS YET UNFOUNDED--THAT THE RECENT TAX REFORM LEGISLATION WILL HURT AMERICAN BUSINESS PEOPLE WORKING ABROAD.

-STANDARDIZE CORRUPT PRACTICES REGULATIONS. THERE IS A SENSE THAT THE VARIOUS CORRUPT PRACTICES STATUTES AND REGULATIONS MUST BE INTEGRATED. MANY REMAIN UNCERTAIN ABOUT THE DIFFERENCE BETWEEN A GIFT AND A BRIBE, FOR EXAMPLE. AT WHAT POINT, MANY WONDER, DOES ONE CROSS A SUBTLE LINE IN AMERICAN LAW WHILE TRYING TO WORK WITHIN NON-AMERICAN CUSTOMS.

-Resist Protectionist Sentiment. American business people engaged in trade-related activities are increasingly feeling the negative international reaction to American protectionist sentiment. They speak of such things as the shift away from American grain as Japanese trading companies increasingly move away from American markets and towards China. Others speak of having their products blocked in China by agencies that are reacting to the freezing out of Chinese goods.

APPENDIX

PROFILE OF CORPORATE RESPONDENTS

PROFILE OF CORPORATE RESPONDENTS

A five-page survey was administered by the Midwest China Center in November, 1986. Answers from 41 of the corporate respondents have been used to prepare this report.

The respondents descriptions of their firms indicate these firms' diversity in:

-Size

-Product line

-Regional base

SIZE OF FIRM

For the purposes of this study, firm size was measured in terms of Gross Annual Sales. The following chart shows that:

-About half of the respondents' firms (55%) had annual sales of less than $100,000,000 annually

-About half (45%) had sales in excess of $100,000,000

In the analysis in this report, $100,000,000 will be the line dividing large and small firms.

PRODUCT BASE

The firms that participated in this study are primarily manufacturers and assemblers of products. The manufacturers and assemblers were almost evenly divided between those labelled "mature technology" firms--those using techniques common to the Midwestern industrial belt--and those with more advanced product and process technologies. The study also included firms involved in service, finance, and construction.

GEOGRAPHIC LOCATION

Most of the firms participating in this study were affiliated with the Midwest China Center, and thus the respondents have a strong Midwestern center of gravity. Many of these Midwestern firms, however, were truly international--in terms both of the scope of their business activity and their views about the importance of an international arena. Several of these firms, in fact, have been pioneers in the new China market, and in a number of cases they have almost a decade of direct experience there.

CHART 12

OVER HALF OF THE FIRMS HAVE ANNUAL SALES UNDER $100 MILLION

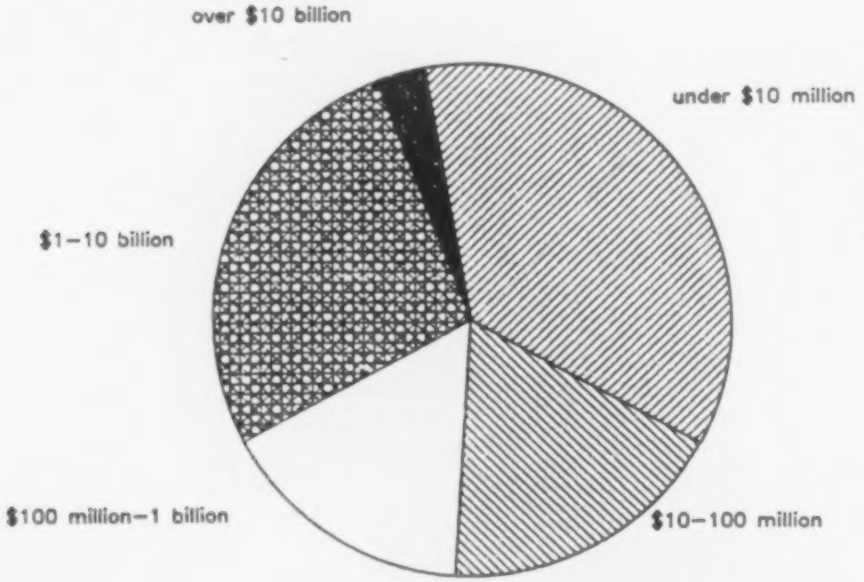


CHART 13

MOST OF THE FIRMS ARE ENGAGED IN MANUFACTURING

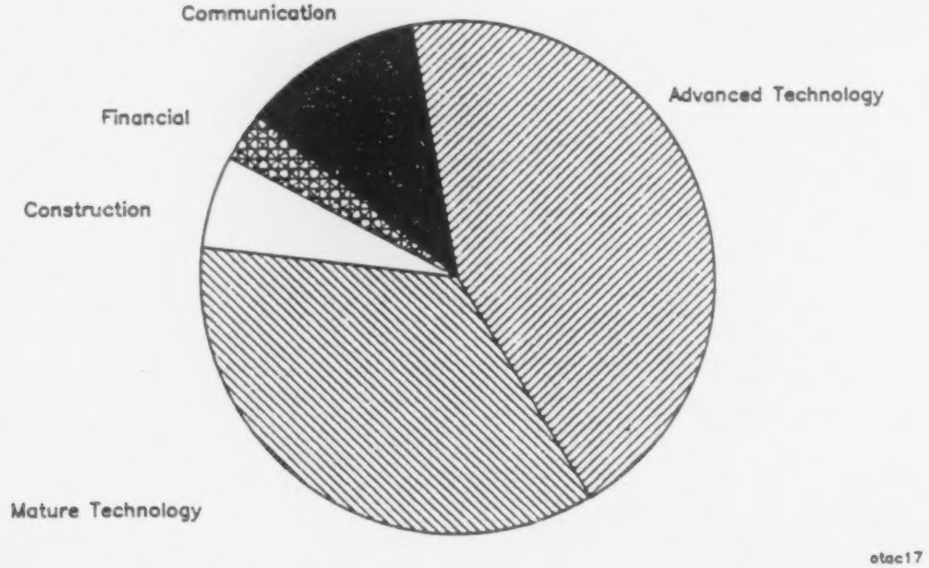
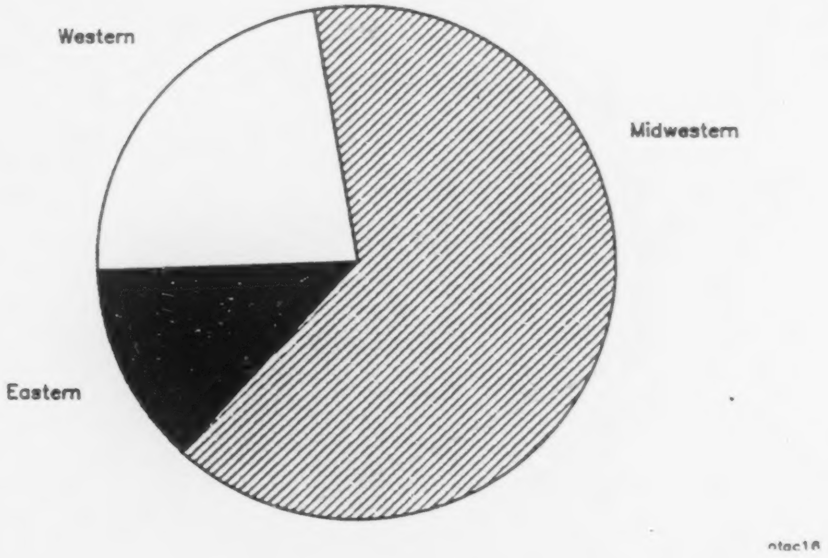


Chart 14

MOST OF THE FIRMS HAVE HEADQUARTERS IN THE MIDWEST



OTA PROJECT
Data Collection Sheet

NOTE: This cover sheet will be separated from the questionnaire and destroyed. Your company name will not be tied to the responses on the attached survey.

Company Name: ____

Address: ____

____

Gross Sales: ____

Company Description: ____

____

____

____

Product lines/services introduced to China: ____________________

____

Type of Involvement:
(Check those applicable)

_______ product sales
_______ joint ventures
_______ assembly agreement
_______ licensing agreement
_______ other, please specify:

_______ Please provide Annual Report for the Midwest China Center

Person(s) Completing Survey (Date): ____________________________
& Business Address(es) ______________________________________

____

____

____

SURVEY ON TRANSFER OF TECHNICAL AND SCIENTIFIC INFORMATION AND/OR SALES TO PEOPLE'S REPUBLIC OF CHINA

FOR OFFICE USE ONLY

About what fraction of your entire company's revenues are represented by exports? 1 _______

_______ less that 1%
_______ 1-5%
_______ 5-10%
_______ 10-25%
_______ 25-50%
_______ more than 50%

Please indicate which of the following characteristics apply to your China business: 2. _______

_____ only a couple of transactions - unlikely to be repeated
_____ likely to continue at its present level
_____ likely to increase in the future
_____ don't know

Many China ventures involve the transfer of technology, expertise, and/or scientific information in a variety of forms. Which of the following ways of transferring such information have you used in your China venture? (check all that apply) 3 _______

_______ sale, lease, or lending of equipment
_______ direct sale of technical information
_______ transfers of technical knowledge during presentations or proposals
_______ licensing of technology and proprietary information
_______ training
_______ joint ventures
_______ co-production
_______ other, please specify:

With reference to your answer in question #3, what problems, if any, were encountered during these transfers? 4 _______

Some companies have found the transfer of technology, expertise, and/or scientific information very important to completion of their sale. How important was it to you? (please (x) the appropriate point on the scale) 5. _______

not important — somewhat important — very important

How does the level of sophistication of the technology of your exports to China compare to those typical of your company sales in general? (please (x) the appropriate point on the scale) 6 _______

lower — same — higher

With which developing countries or areas besides China do you do business? (check all that apply) 7 _______

_______ None
_______ India
_______ Taiwan
_______ Korea
_______ Latin America
_______ Other, please specify:

FOR OFFICE USE ONLY

To which developing countries or areas besides China have you transferred technology, expertise, or scientific information? (please note the form of the transfer as in question #3 and check all that apply)

8. ______

country/area	form of transfer
______ None	
______ India	____________________
______ Taiwan	____________________
______ Korea	____________________
______ Latin America	____________________
______ Other specify	____________________

How have your experiences been with the above-noted countries as compared to China? Check (✓) all that apply. Then please (x) the appropriate point on the scale.

9. ______

	much worse	much better	about the same
_____ None			
_____ India			
_____ Taiwan			
_____ Korea			
_____ Latin America			
_____ Other specify			

How important were these factors in your decision to enter the China market? (please (x) the appropriate point on the scale)

10. ______

	not important	somewhat important	very important
size of market			
growth potential			
labor pool			
availability of raw materials			
corporate strategy			
other, please specify			

How important were the following specific objectives for your China venture(s)? (please (x) the appropriate point on the scale)

11. ______

	not important	somewhat important	very important
foothold in the market			
short-term profits			
long-term profits			
growth in sales			
other, please specify			

To what extent did your venture(s) meet these objectives? (please (x) the appropriate point on the scale)

12. ______

none	some	all

How much time had you **expected** to invest between initial inquiries and beginning to do business?

13. ______

______ 3 months
______ 6 months
______ 1 year
______ 2 years
______ 3 years or more

How much time was **actually** required between initial inquiries and beginning to do business?

14. ______

______ 3 months
______ 6 months
______ 1 year
______ 2 years
______ 3 years or more

Several firms doing business in China have found their **negotiations** for subsequent ventures to be substantially shorter. What has been your negotiation experience with subsequent China ventures?

15. ______

_____ substantially shorter
_____ the same
_____ longer
_____ don't know

If your negotiations were shorter, please explain why?

Do you now have an office or representative in China? yes ______ no ______ 16 ______

If not, do you plan to have an office or representative in China? yes ______ no ______

Which of the following are significant disadvantages of a small or moderate size company trying to do business in China? (check (✓) all that apply) 17 ______

______ can not afford an office or full-time company representative
______ do not have the resources to get information from China
______ do not have the resources to get information from the U.S government, or to expedite the export control process
______ no name recognition or leverage in China;
______ other, please specify:

In **preparing** to enter the China market was the following information readily available to your company: (please check all that apply) 18 ______

_____ China's need for products and technology
_____ particular end-users of your products
_____ Chinese decision-making
_____ Chinese law and practices
_____ China's ability to purchase equipment from abroad
_____ competition
_____ likely market share
_____ labor costs
_____ availability of raw materials
_____ U.S. law and regulation
_____ U.S. governmental assistance for exports
_____ Other, please specify:

Which of the following information categories did you find to be important **after** entering the China market? (please check all that apply) 19 ______

_____ China's need for products and technology
_____ particular end-users of your products
_____ Chinese decision-making
_____ Chinese law and practices
_____ China's ability to purchase equipment from abroad
_____ competition
_____ likely market share
_____ labor costs
_____ availability of raw materials
_____ U.S. law and regulation
_____ U.S. governmental assistance for exports
_____ other, please specify:

Please check (✓) the sources you used and evaluate the usefulness (accurate, timely, specific) of the information they supplied by marking the appropriate point on the scale. 20 ______

	no use		some use		very useful
_____ U.S. Department of Commerce					
_____ Chamber of Commerce					
_____ State Agencies					
_____ Trade Associations					
_____ Regional or local China Organizations					
_____ National Council for U.S.-China Trade					
_____ Chinese Governmental Agencies					
_____ Private Consultants					
_____ International Accounting Firms					
_____ Other, please specify:					

21. **Please check (✓) which of the following Federal activities you have used in your China ventures and evaluate their usefulness by marking the appropriate point on the scale.** 21 ______

	no use		some use		very useful
_____ **Foreign Commercial Service**					
_____ **Trade Shows**					
_____ **Trade and Development Program**					
_____ **Export-Import Bank**					
_____ **Overseas Private Investment Corporation**					
_____ **Bi-lateral Agreements**					
_____ **Other, please specify:**					

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What government activities could be expanded that would improve your export competitiveness in the China market? (please check (√) all that apply) 22. _____

_____ Supplying more information on the China market to industry
_____ Playing a middleman role between China and U.S industry
_____ Providing formal frameworks for negotiations (e.g. bilateral agreements)
_____ Oversight on China's compliance with agreements such as on patents
_____ Feasibility studies
_____ Financing
_____ Avoiding protectionism in U.S. markets from Chinese products
_____ Foreign aid associated with financing of projects (not now a U.S. program for China)
_____ Other, please specify:

Have government export control procedures substantially affected your business with China? 23. _____

yes: _____ no: _____ dont' know: _____

If your answer was yes, please mark the appropriate point on the scale.

	none		some		greatly
Licensing delays					
Paperwork burden					
Uncertainty					
Limits on exports					
Other, please specify					

Are you able to get adequate, timely information on export regulations and the status of your export license applications? 24. _____

yes _____ no: _____

Do export control regulations and their application reflect an adequate understanding of the technology and its military applications? 25. _____

yes _____ no: _____

What fraction of your export licenses for China have gone to CoCom for their evaluation? 26. _____

_____ less than 1%
_____ 1-25%
_____ 25-50%
_____ more than 50%
_____ don't know

Is the effort necessary to obtain an export license a significant barrier to exporting? 27. _____

yes _____ no _____ don't know: _____

Have you used consultants to expedite your China export license applications? 28. _____

yes _____ no _____ don't know: _____

If you have used consultants in your attempts to obtain export licenses to China, have the benefits, in your opinion, overweighed the costs? 29. _____

yes: _____ no: _____ don't know: _____

What changes in U.S. or CoCom regulation would be helpful for your China business (within the overall context of U.S.-China relations? 30. _____

U.S. Regulation:

CoCom Regulation:

In your opinion, do your competitors from other countries doing business with China have significantly less difficulty with export controls? 31. _____

yes: _____ no: _____ don't know: _____

If yes, please check (√) which of the following are significant problems:

_____ fewer delays
_____ less paperwork
_____ less certainty
_____ fewer limits on exports
_____ other, please specify:

Can you identify any specific instances of exporters from other countries supplying equipment or technology to China that would be forbidden by U.S. regulations? Please explain. 32. _____